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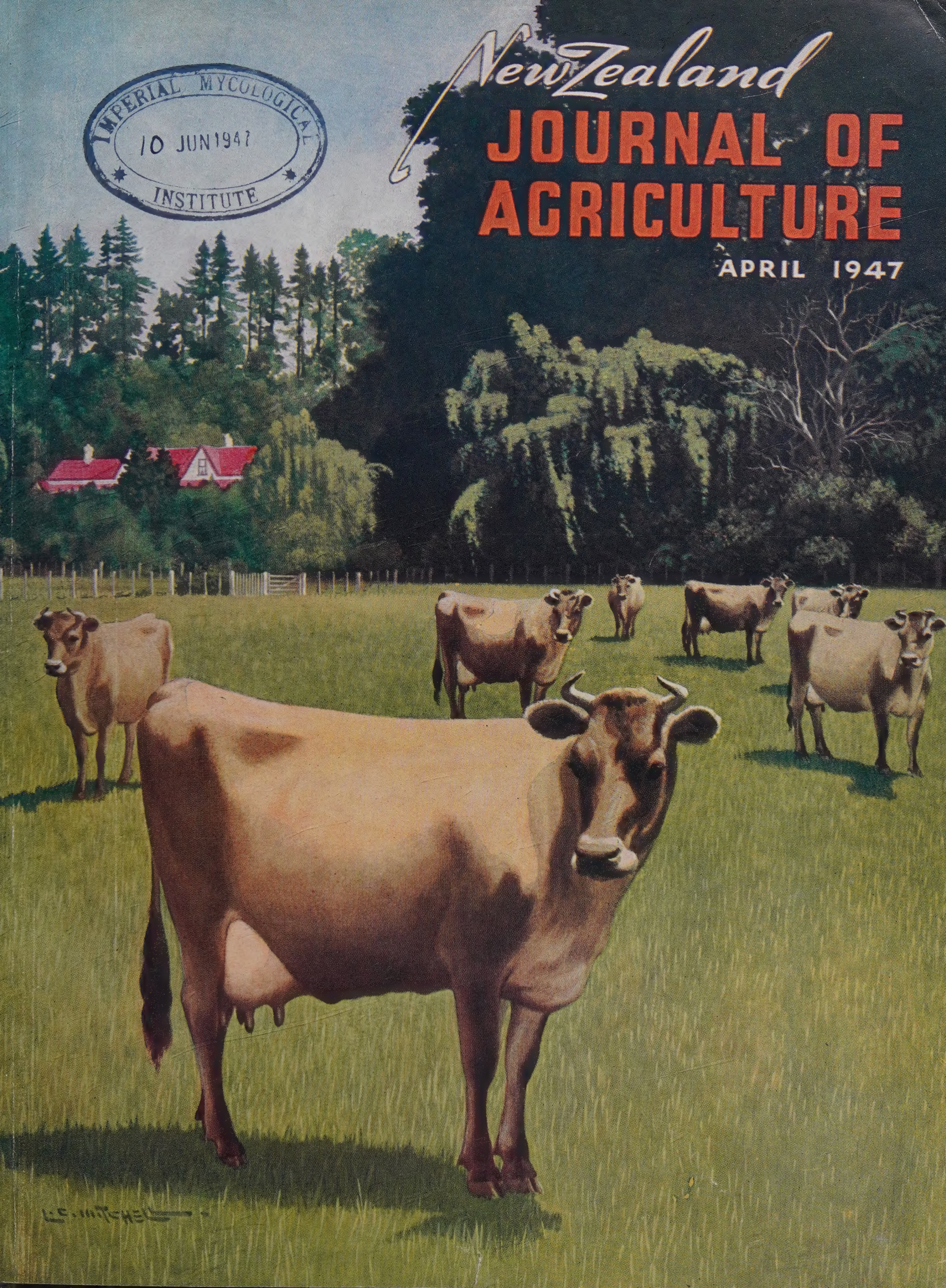

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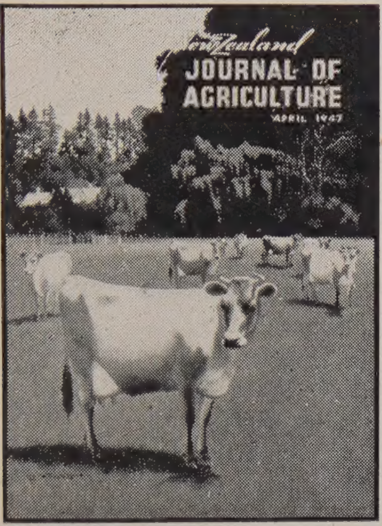

The gracious setting of a pioneer Hawke's Bay homestead and a leading Jersey herd bred on the W. T. Williams estate, Pukehou, were painted for this month's cover by L. C. Mitchell, from a photograph by courtesy of the "Dairy Exporter." The foremost cow, Hollyoak's Annie, with a C.O.R. record of 1056.49lb. fat, was for many years New Zealand's champion Jersey C.O.R. cow, and one of the first cows of the breed in New Zealand to exceed 1000lb. butterfat under C.O.R.

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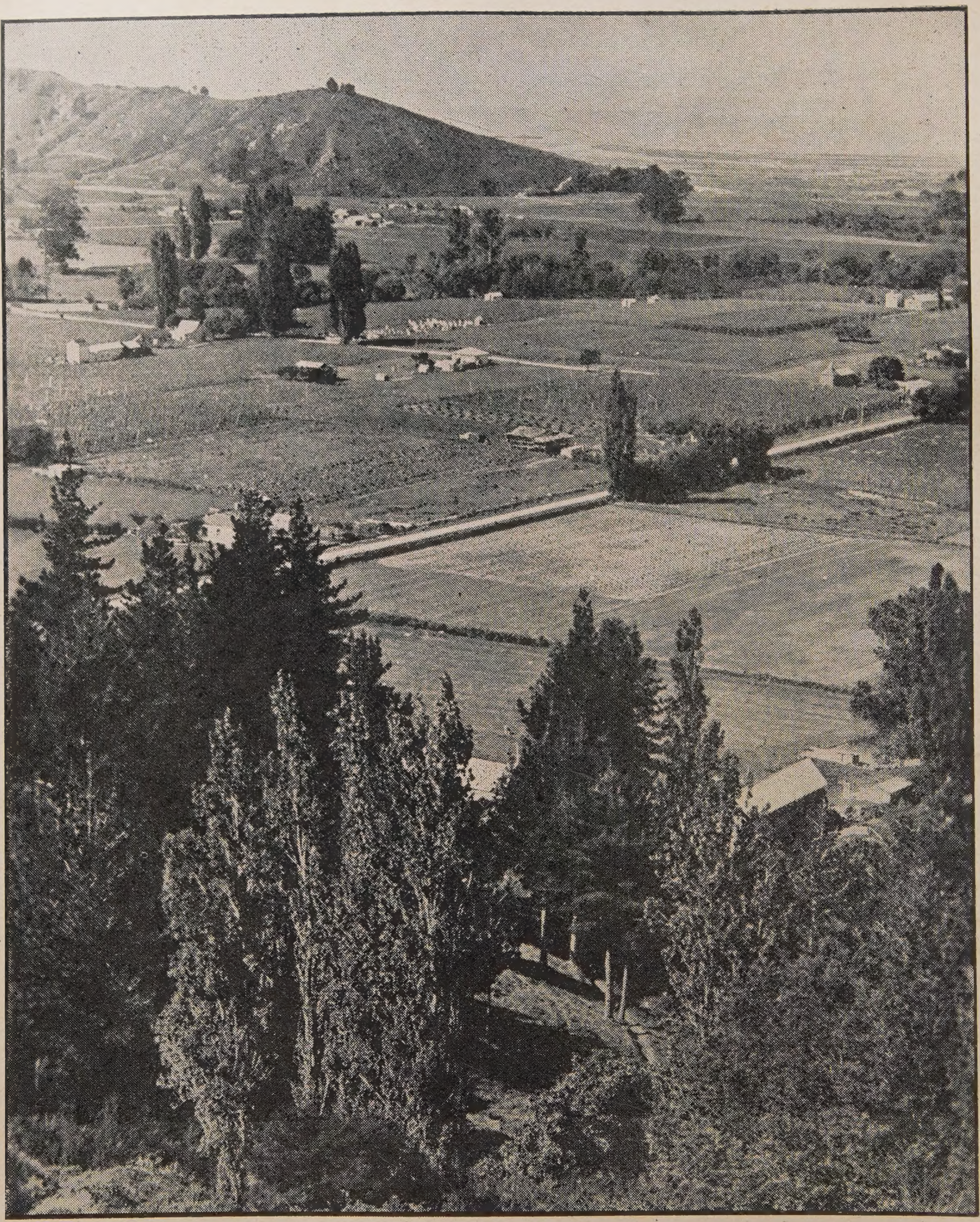


[*Auckland "Weekly News."*

Riwaka in the Waimea County, the centre of tobacco and hop growing in New Zealand. Situated on the coast about 37 miles north-west from Nelson, the district has a climate ideally suited for horticultural industries.

THE WORLD FOOD CRISIS

THE immediate world food crisis and the possibility of preventing another post-war slump when the present crisis is past were dealt with by the Director-General of the Food and Agriculture Organisation of the United Nations, Sir John Boyd Orr, in a broadcast from Washington D.C. to the eleventh annual meeting of the Canadian Federation of Agriculture at Winnipeg, Canada, on January 29. A report of Sir John's address is published below.

"I AM glad of the opportunity of speaking to this great gathering even though I cannot be with you in person in Winnipeg," said Sir John. "You represent the farmers of one of the greatest food-exporting countries in the world. I am a farmer in the greatest food-importing country in the world. But whatever country farmers come from, our problems are pretty much the same. Before the war our problem was to find a market at a remunerative price for what we could produce. The position today is very different. Many nations are clamouring for food. The problem of the exporting countries is to decide how much food they can export and to what nations they will sell it.

"But like other farmers many of you fear that in the near future you will again be faced with the problem of unmarketable surpluses with a catastrophic fall in prices. In other words, that we will follow the same course that we did in the First World War—high prices during the war and a slump in prices after the war.

Aspects of Problem

"Tonight I want to speak about these two aspects of the food and agriculture problem—the immediate world food crisis and the possibility of preventing another post-war slump when the present crisis is past.

"The food crisis today is little better than it was this time last year. There are still many millions in Europe existing on a diet which gives only about half the number of calories that are in the diet of the well-fed people of North America. There are many more millions in Asia existing on a diet even scantier than that in parts of Europe.

"Those of you who have never been short of all the food you want must find it difficult to realise the misery of those unfed millions, trying to maintain life and hoping against hope that more food will be available soon. Apart from the misery of the people, the shortage of food reduces the amount of work men can do and so delays the rehabilitation of the war-devastated countries.

"It is hoped that the worst of this crisis will be over when we get in this year's harvests. Though there will be a shortage of some foods for at least two years and possibily three, if this year's harvests are good all over the world, it will be possible to increase the bread rations, so that though millions must resign themselves for a long time to a meagre diet, there will be fewer people suffering from actual hunger.

"But if we have good harvests in the next two or three years, exporting countries may be faced with a problem very different from this one they have now. They may find themselves with unmarketable surpluses of cereals and other agricultural products. During the war production of food increased in almost all exporting countries. In North America it increased by about a third. When agriculture in Europe gets back to the pre-war level there may not be a European market for this increased production. Governments may guarantee prices, but if the home demand is met and the surplus for export is greater than the world market will take, Governments cannot continue indefinitely to pile up surpluses of food or any other agricultural commodity for which there is no market.

Sir John Boyd Orr.

Action Needed to Prevent Slumps

"Action at an international level is needed now to prevent another post-war slump, because if the situation is left to the free play of economic forces plus unco-ordinated controls by individual Governments, there must be a drastic fall in prices, with resulting decrease in the purchasing power of primary producers. This will lead to restriction of the market for industrial goods, with resulting unemployment, which further decreases the market for food. That is the descending spiral we had in the late 1920's which ended in the world economic crisis that brought ruin to farmers and unemployment and poverty in the towns.

"Of course we might try again the remedy of restriction to adjust supplies to economic demand, but that also reduces the total income for agriculture. Further, it means the end of free enterprise with maximum production to meet human needs.

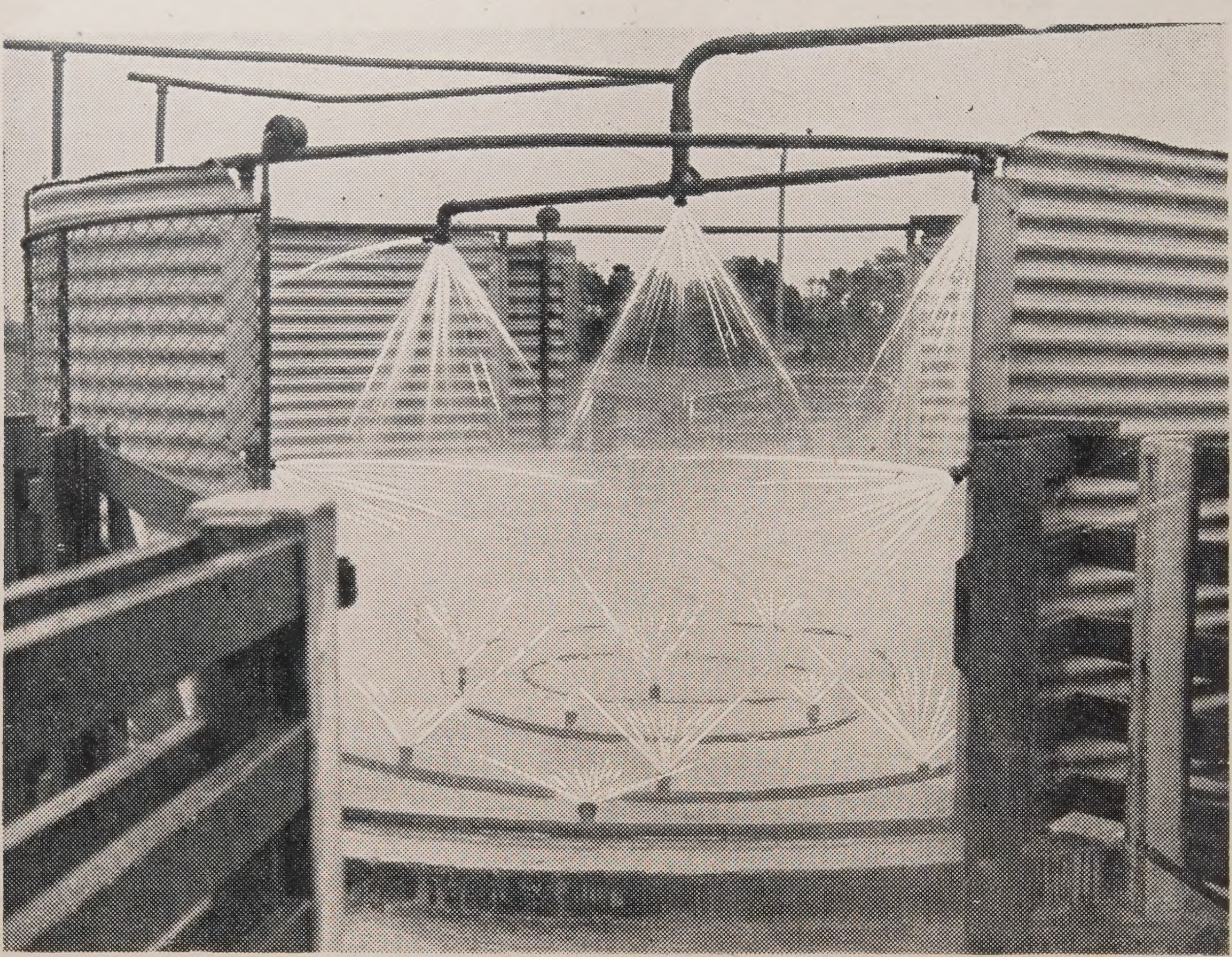
"In any case I am not so sure we can try restriction again. In all countries there is a growing body of enlightened public opinion which will no longer tolerate plans to restrict production of food so long as there are people who need more food. I am sure that in the country I come from they will never again allow separated milk to be poured down the drains to keep up prices when it is known that there are millions of children in families too poor to purchase sufficient milk. No Government with the interest of the people at heart will restrict production so long as there is not enough food to maintain the health of the whole population.

"That brings me to the consumers' problem. Before the war more than half the population of the world was unable to obtain sufficient food for health. In the 1930's we had on the one hand unmarketable surpluses of food bringing ruin to farmers, and, on the other hand, 1,000,000,000 people, some of them even in the wealthiest countries, suffering from disease and other handicaps owing to lack of enough of the right kind of food.

"Such was the crazy world in which we lived in pre-war days. No wonder many people were exasperated by the chaotic state of affairs and wanted to adjust the economic system so that as far as food and other essentials of a full and healthy life were concerned there would be production for consumption and distribution according to need.

Formation of FAO

"During the war the nations which had united to destroy the Nazi terror decided to remain united to co-operate in rectifying the errors and evils of the



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pre-war world. A number of United Nations organisations were set up for this purpose. The first of these was the Food and Agriculture Organisation known as FAO, which came into being at Quebec a little over a year ago.

"It is the job of FAO to deal with these problems of food and agriculture which we have been considering. According to its constitution, FAO can collect and disseminate statistical and other information. It can investigate problems of food and agriculture; it can send technical missions and give technical assistance to countries which ask for such help; and it can make recommendations. All these things are needed and FAO is doing them. But a vast amount of work of that kind was being done long before the crisis of the 1930's occurred. . . .

Part of FAO in Food Crisis

"Early last spring, a few months after FAO was established, many people thought that the post-war food crisis would end with the 1946 harvest. Indeed it was spoken of by some of the people in authority as a 90-day crisis.

"From the information that was available it was clear that the food shortage would last long after the 1946 harvest and that there would be a shortage of some essential foods even after the 1947 harvest. FAO therefore recommended that the Governments of the countries which could make a major contribution in dealing with the crisis, together with representatives of the temporary international organisations dealing with food, should hold a meeting in Washington on urgent food problems. At the same time it sent an appraisal of the world food situation to all Governments so that they would know how serious was the position.

"That meeting, which was held last May, agreed on the recommendations that should be made to all Governments to use the food provided by the 1946 harvest to the best advantage and to make the 1947 harvest as large as possible. It set up the International Emergency Food Council, consisting now of representatives of 29 Governments, to work out the allocation of exportable surpluses in accordance with the needs of different countries. That council, staffed by FAO and meeting in FAO headquarters, does what is possible and will continue to function until the worst of the crisis is over.

"Then every three months FAO issues an appraisal of the world food situation to all countries so that the Governments may be fully informed of the position.

"Might I take this opportunity of expressing the hope that countries which have food and which have already been so generous to countries in need will do everything possible in the next six or seven months to increase exports, and that private organisations and individuals who can, from their abundance, send food will redouble their efforts. We cannot turn a deaf ear to the cry of mothers and children: 'Carest thou not that we perish?'

Longer-term Problems

"But to my mind, tragic though the present situation is, the longer-term problems of food and agriculture are equally important and urgent. At the Copenhagen conference of FAO last September proposals were put forward for the establishment of a World Food Board with funds and authority to promote concrete measures on a world scale for the orderly development and expansion of agriculture. This development and expansion would be directed toward providing sufficient food for all the people of the world, stabilising prices on the international market at levels fair to producers and consumers, and building up a world reserve of food against any drought or disaster which threatens famine.

"The Food Board recognised that expansion of agriculture must go hand in hand with great industrial expansion and increase in world trade. For that the poorer countries would need credits or loans to enable them to get the capital equipment necessary—loans made on a plan of development approved by the appropriate international authority and by the Governments concerned. It was suggested, therefore, that the World Food Board should have on it representatives not only of FAO but of all the other United Nations organisations concerned, such as the International Bank for Reconstruction and Development, the proposed International Trade Organisation, and the International Labour Organisation; and that the measures proposed by the board should be fitted into plans for world economic development, which it is the duty of the Economic and Social Council to promote.

"If such proposals as these were carried into effect, there would be a world market for all that could be produced for many years ahead. As you know, the people in the United Kingdom have a very spartan diet, though it gives them about 2700 calories a person a day. The world food supply would need to be increased by considerably more than 50 per cent. to enable the diets of all the people in all countries who get less food than that to reach such a level.

"Taking account of the increase in world population, food supplies would need to be increased by more than 100 per cent. so that all people would be reasonably well fed by 1970. So if the world supply of food is to be regulated by the needs of human beings, there will be no surplus in our day.

"The Copenhagen Conference approved of the objectives of the FAO proposals and set up a commission consisting of representatives of 17 Governments to consider them and any other plans which would have the same result. Lord Bruce, former Prime Minister of Australia, was appointed chairman. At the final meeting of the commission Lord Bruce handed the report of the commission to the Director-General of FAO.

Commission's Report

"This report does not go the full length of recommending a World Food Board with authority and funds of its own. It does, however, recommend closer consultation among Governments, including the setting up of a World Food Council which would be a part of FAO and would consist of representatives of 18 nations. The commission's report puts the responsibility upon the individual nations, but the World Food Council would provide the machinery whereby the nations could act together to bring about an orderly development of agriculture to produce the food that the people of the world need, to stabilise prices in the world market at levels fair to producers and consumers, and to build up reserves of food against any drought or disaster which threatens famine.

"The last two—price stabilisation and the setting up of food reserves—would be effected through individual commodity arrangements or agreements negotiated by Governments, as in the case of wheat for example. It is also recommended that, wherever appropriate, these commodity agreements might include provisions, which would be fully safeguarded, for the sale of food at special prices to relieve chronic malnutrition in the areas of great hunger and poverty.

"Thus the recommendations for a World Food Council are based on the great ideals of FAO—food on a health standard for the people of the world, and prosperity and stability for an expanding agriculture. They bring these ideals down to common earth on the basis of what Governments today are willing and able to do. Had Governments been able to agree to more, we might have been able to move further and faster. But the important thing is that a practical beginning has been made.

WORLD FOOD CRISIS . . .

"If Governments will carry out what the Preparatory Commission recommends, we shall be on the road to realising, in the daily lives of the people of both town and country, the ideals of enough food for all and prosperity and stability for agriculture.

"The report of the Preparatory Commission is being sent to the 47 nations adhering to FAO. It will then be considered by the FAO executive committee, which meets in Rome on March 3, and finally it will be considered by the full FAO conference. To add a World Food Council with these new duties to the structure of FAO will require an amendment to the FAO constitution, and it is necessary to give Governments four months' notice for the proposed change. Thus the conference will probably be held at the end of August or the beginning of September. There Governments must decide whether they will set up the proposed World Food Council.

"This conference is one more test, a crucial test, of the willingness of the nations to co-operate on practical measures for providing food for the people and prosperity for the food producers and, at the same time, opening up great new markets for industrial products which will help to maintain full employment. I have said before that if the nations cannot work together on food, they can work together on nothing. Let me say now that if Governments do not give wholehearted co-operation to the beginnings of a food plan for the benefit of the people of the world, there is no alternative to a third world war.

"Now we must not leave it all to Governments. If we believe in democracy, Governments carry out the wishes of the people. There is no doubt whatsoever in my mind that 99 per cent. of the people of the world want the things that the World Food Council can do. In any case it is their duty to make their wishes known. I suggest that you farmers should get the 'Proposals for a World Food Board' and the Bruce Report. Whether you approve or disapprove say so, not only in your national organisation, but also through the International Federation of Agricultural Producers. It is time the farmers of the world got together and spoke with one voice.

"I wish also that the women's associations and other organisations of townspeople would study the reports and express their views on them. Only in this way can we have a well-informed public opinion that will be a guide to the action of Governments. What FAO does and, indeed, what all of the new United Nations organisations do will be determined in the last resort by what the people of the world, acting through Governments, want them to do."

Buttermaking on the Farm

MANY people still make butter on the farm, and the following notes provided by the Dairy Division may be of assistance to them.

CREAM should be cooled down to as low a temperature as possible, say, 60 degrees F. or under, as it leaves the separator. This is best done by allowing it to flow from the separator over a cooler, through which cold water is passing, and then into a can. The can containing the cream should be removed to a place where the atmosphere is kept fresh and cool, and left there for four to six hours to allow the fat globules in the cream to become completely cooled before ice cubes.

Where a household refrigerator is installed it would be an advantage to place the cream after separation and cooling in the refrigerator and reduce it in temperature to about 50 degrees F., and to keep it there for 24 hours before churning. It would be helpful also to cool the wash water to a temperature lower than that of the cream by means of the ice blocks from the refrigerator, or by cooling a sufficient quantity of water in the refrigerator and reducing it further by adding the churning.

Experience has proved that to produce butter with long-keeping quality and of mild flavour the cream requires to be churned as sweet as possible, and cold. Where a fuller flavour is desired and long-keeping quality is not of vital importance the cream may be allowed to sour a little before churning. A slight sourness is usually present about 24 to 48 hours after separating when the cream has been kept at 60 degrees F.

Temperatures much over 60 degrees are high for churning. The lower the temperature, the firmer the butter will be, and the better it is handled without causing greasiness. The churning should be continued until the butter forms into granules about the size of wheat kernels. The buttermilk should then be run off and replaced with a little more than an equal quantity of water of about 4 degrees lower temperature than the cream, for the purpose of washing the butter granules. The washing should be repeated and the second wash-water come away almost as clear as when placed in the churn. After washing allow the butter granules to drain for a few minutes, then place them on the worker and sprinkle the mass with salt at the rate of half an ounce of salt to the pound of butter. Divide the mass into three, and then form into rolls by pressing and folding each about a dozen times; afterwards remove to a cool place, and let stand from four to six hours or longer to allow the salt to dissolve. The butter will then have a streaky appearance, and should be placed again on the worker, and each roll worked about a dozen times, or until the colour is even and all traces of streakiness disappear.

In the event of the butter being required for use some months after making—it is sometimes called potted butter and is usually made during the flush months of the dairy season for use during the winter months—a further aid to the keeping quality is obtained by pasteurising the cream to a temperature of 175 degrees F., or over, as soon as possible after the cream is separated. This can be done by setting the vessel containing the cream in a copper of boiling water and gently stirring the cream occasionally. After cooling the cream it can be let stand until the following day. To ensure a desired flavour in the butter some makers add about ½ per cent. of starter to the cream immediately after cooling. Starter is specially-prepared soured milk, and is usually obtainable at dairy factories. During the autumn and winter months the scalding or pasteurisation of ripened cream from the milk of cows long in lactation will tend to prevent prolonged churning.

Experience has also proved that neither the addition of an unusually large amount of salt, say an ounce or more per pound of butter, nor the packing of butter in brine enhances the keeping quality of butter, and also that the storage of butter in boxes in bulk rather than in 1lb. pats at temperatures considerably below freezing point is essential to prevent undue loss of quality.

The first essentials for success in buttermaking are sound-flavoured, cool, fresh cream, good water, and sanitary conditions.

Note.—If lightly-salted butter, or "powdered" butter as it is sometimes termed, is required, use a quarter of an ounce of salt per pound of butter.

SMALL FRUIT CULTURE

Selection of Raspberry Canes for Planting

THE present under-production of raspberries in the Dominion has been caused partly by the shrinkage of the total acreage in the period between the First and Second World Wars, and partly by low yields in many plantations. The acreage is now slowly increasing, but yields per acre are still far from satisfactory. One of the causes of low yields is the planting of unsuitable material, and the question of improving the standard of raspberry stocks is discussed in this article by J. P. Hudson, Horticulturist, Wellington.

RASPBERRIES

THE choice of raspberry canes for planting was dealt with in the December, 1946, issue of the "Journal," when the following recommendation was given for what could be considered ideal planting stock: "Raspberry canes used for planting should be true to name, of a proved high-yielding strain suitable for the locality, free from 'rogues' (either chance seedlings or other named varieties), well rooted, and reasonably free from virus disease, fungus disease, and insect pests."

There would no doubt be a great demand for such stock if it existed, but it was realised when the article was written that few raspberries were available which could honestly be said to measure up to this specification. The whole question has therefore been very carefully considered to see how the situation can best be remedied.

The crux of the matter seems to lie in the requirement that the selected canes should be "of a proved high-yielding strain." All the other requirements are subsidiary to the need for raspberries to be of a type capable of producing regular, heavy crops. It must be obvious, even to the casual observer, that there are great variations in vigour of growth and weight of crop between the stocks planted in different raspberry gardens even in the same district, although the plantings may all be said to be of the same variety. A great deal of this variation is no doubt caused by uneven soil conditions and by differences in management practices and efficiency between one grower and another.

Worthless "Strains"

Even when allowances are made for these causes of variation, however, there seems to be another factor to be taken into account. Growers who have grown stocks of the same variety from different sources have found a variation in performance between the different batches of plants.

There seem to be two or more "strains" of some of the common commercial varieties. The "strains" look very much alike, and are not necessarily different varieties, yet they vary considerably in vigour and, most important of all, in cropping capacity.

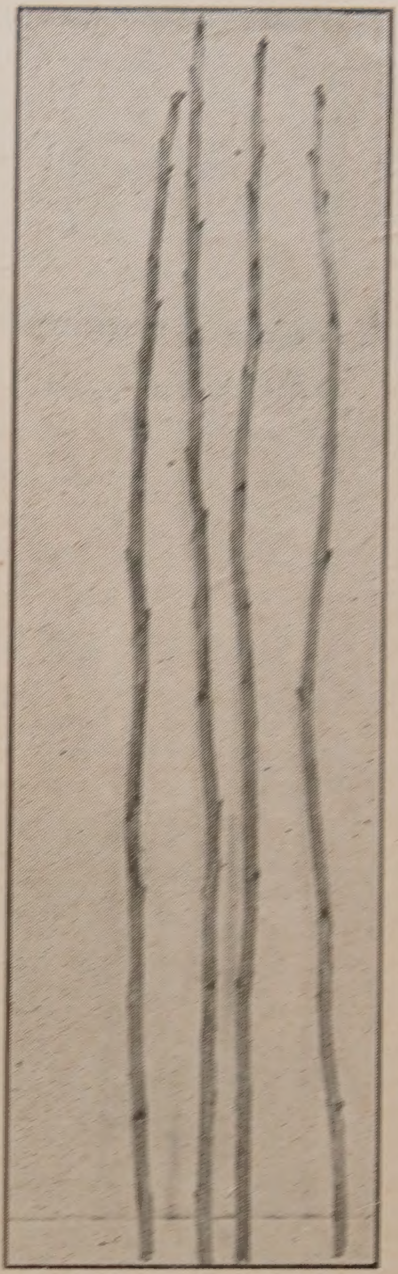
When an investigation was carried out in Britain in the early 1920's it was found that no fewer than eight distinct strains of raspberries were masquerading under the name Red Antwerp, seven as Fillbasket, and five as Superlative, and that there was a very marked difference in growth, vigour, and cropping between the different strains of any one of these varieties.

Planting Trials Needed

The first step in producing the highest-class raspberry planting stock is obviously to compare the cropping capacity of the various strains of each variety by planting them side by side in a properly-designed trial. When the results of cropping show which strains regularly yield the heaviest weight of fruit the light-yielding types can be discarded and stocks of the heavy-yielding strains rapidly built up for distribution to growers. Similar comparative trials between different varieties, including the newer varieties from overseas, are also, of course, required. These trials should ultimately be repeated in each raspberry-growing district to complete the survey and supply the prospective planter with exact information about which are, in fact, the "proved, high-yielding strains" of raspberries most suitable for his particular district.

It is hoped that a comparative trial of the existing commercial varieties and strains of raspberries can be planted this year. As a necessary preliminary the Horticulture Division this summer made a comprehensive survey of raspberry plantations in all the principal raspberry-growing districts, with the object of studying varietal characteristics, and, if possible, sorting out the present confusion regarding the names applied to the common commercial varieties.

An accurate knowledge of varieties and strains is essential as one of the foundation stones on which a rejuvenated raspberry industry can be based.



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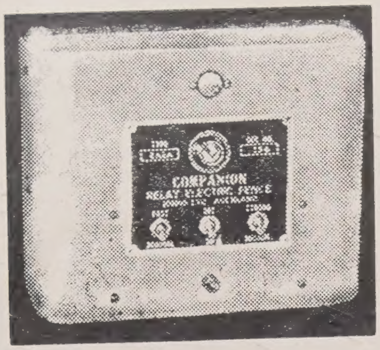
Long, straight, well-ripened red currant shoots ideal for cuttings.

CURRANTS AND GOOSEBERRIES

The usual method of propagating black and red currants and gooseberries is by hard-wood cuttings taken during the autumn or winter any time after the leaves have fallen. The careful grower will mark in the summer, when the bushes are fruiting, those plants which seem most healthy and are bearing the heaviest crops of the right type of berries.

Cuttings taken from marked bushes should give the best possible results. It is always risky to propagate vegetatively from any plant which is diseased, lacking in vigour, or cropping poorly.



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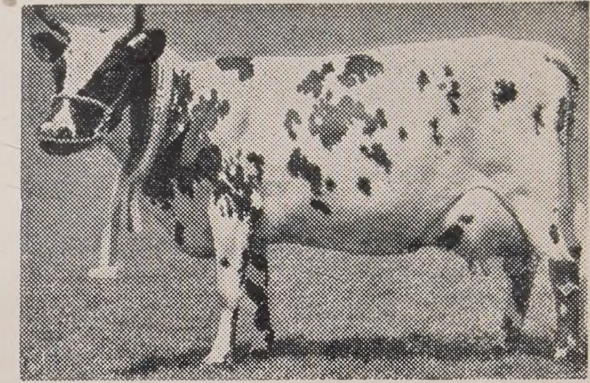

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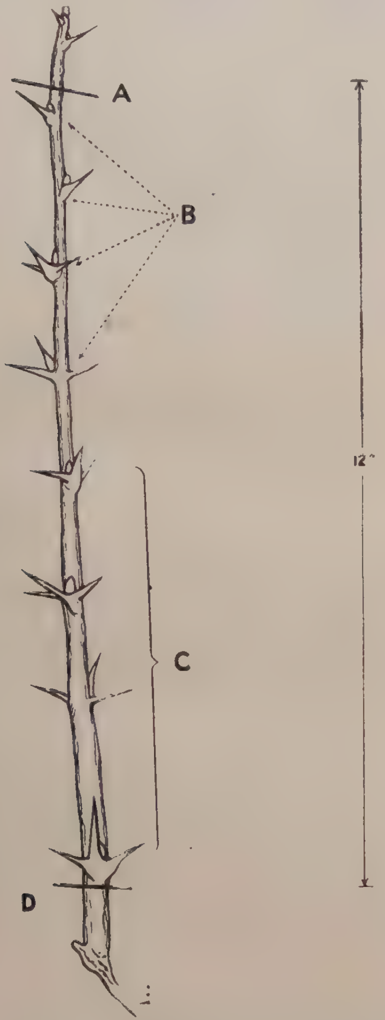
Each cutting should be straight, taken from a piece of new growth (i.e., produced that season), and should be hard and well ripened. Black currant cuttings should be about 10in. long and red currant and gooseberry cuttings 12in. It is said to be an advantage in taking gooseberry cuttings to tear the cutting off the bush with a small amount of older wood as a "heel."

Most growers cut off the terminal bud from each shoot to encourage side buds to break, and this practice has much to commend it. The base of the cutting should be cut off cleanly with a sharp knife or secateurs just below the bottom bud. Rough surgery delays healing of the wound and production of root initials. Where the cutting was secured with a heel this should not, of course, be cut off



In preparing gooseberry cuttings the tip should be cut off each (A) and the spines and all the the remaining buds (C), except the top four (B), then removed. The bottom of the cutting should be cut off cleanly below where the lowest bud was (D), unless the cutting was secured with a heel (E), in which case the heel should be left untouched.

Preparing Cuttings

Red currants and gooseberries bear a proportion of their fruit on shoots or spurs two years or more old. Suckers are a nuisance and should be discouraged, as they do not bear crops of fruit for some years; bushes with a single trunk are much easier to keep weeded than those with several stems arising from below the ground. Consequently the aim in propagating red currants and gooseberries is to produce bushes with clean "legs" from which all the branches rise a few inches above the ground level. To achieve this all but the top four buds should be removed from each cutting, as suckers may later grow from the lower buds if they are left in place. Each bud can be rubbed off with the fingers or preferably chipped off with a pocket knife, together with the spines in the case of gooseberries.

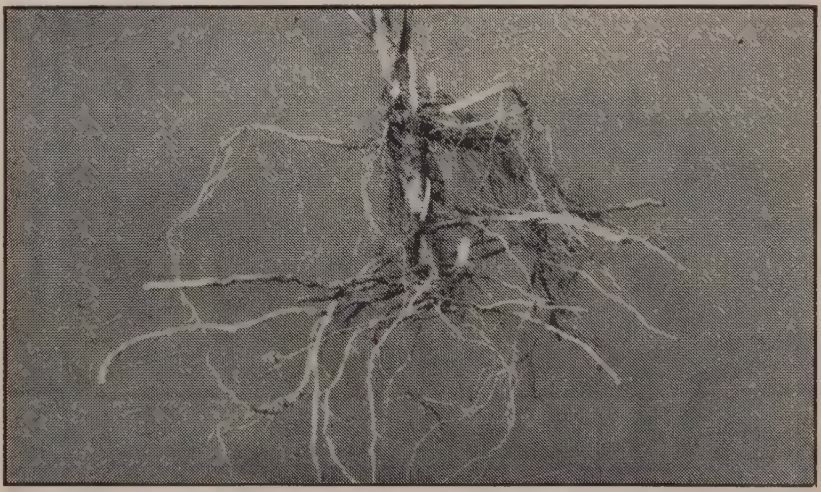
On the other hand the black currant bears most of its fruit each year on strong shoots which grew in the previous year, and the object of management is to encourage plenty of new growth each year by fairly hard pruning. Suckers which arise from below the ground are a welcome addition to the new fruiting wood. Therefore in taking black currant cuttings all the buds should be left on, including the lower buds. These may remain dormant for some years, but it is from them that the first crop of suckers is likely ultimately to grow.

Time to Take Cuttings

Cuttings should be taken as soon as possible after the leaves drop, because the earlier they are inserted in the ground the greater the percentage of strike and the better root system they will make by spring. The site must be well drained, as stagnant moisture in the ground probably causes more loss of cuttings than any other single factor. Moreover, the soil should be of an open texture. Fine silty soils cake around the cuttings and often cause a high percentage of failures. If necessary, a bed for propagating may be lightened by the addition of a layer of sharp sand or coarse soil worked into the top few inches of the bed. A cool site shaded from the direct rays of the midday sun is ideal.

The best method of inserting cuttings is to open up a trench about 4in. deep with one vertical and one sloping face. The cuttings should then be lined out 6in. apart and laid on the sloping face, with up to 6in. of each cutting on the face and the remainder above ground level. Fill the trench in firmly by treading the soil tight, but avoid doing the work at all if soil picks up on the boots, because soil in this condition will cake badly after being trodden.

The reason why many growers prefer to insert cuttings slanting instead of upright may be connected with the fact that roots will form only in the presence of oxygen. The proportion of oxygen in the soil air decreases with increased depth, and the nearer the cut is to the surface the more likely roots are to develop. On the other hand the deeper the cutting is inserted the less likely it is to be rocked by the wind. If cuttings are inserted in a slanting position, a double advantage is gained; first, the cut is kept near the surface of the soil, and secondly, more of the cutting is gripped by the soil than would be the



[Green and Hahn Ltd.

The lower buds were not removed when this red currant cutting was prepared, with the result that several suckers (showing as white shoots among the roots) are now beginning to grow, and will be a nuisance throughout the later life of the bush. All but the top four buds should be removed from all red currant and gooseberry cuttings.

case if it was vertical, although the cut is at the same soil level.

It is an advantage if the cuttings are arranged in the trench so that they slope away from the prevailing wind. Rooting is delayed or may be prevented altogether if the wind rocks or twists cuttings. Moreover, cuttings which whip from side to side in the wind form a funnel in the soil round their stems. This funnel tends to remain filled with water in wet weather to the detriment of the cuttings, especially gooseberries, which are very intolerant of wet conditions at their stem and roots. Where hard frosts cause the soil to "lift," the cuttings should be firmed in again as soon as the soil is fit to walk on after the thaw.

Unless the soil is very loose and sandy, it is not a good practice to push the cuttings into the soil instead of opening up a trench, owing to the damage caused to the bark and, on black currant cuttings, to the lower buds.

Cuttings are best taken, prepared, and inserted on the same day, although some nurserymen stand black currant cuttings in a few inches of water for 24 hours before inserting them. Where cuttings cannot be used at once, or have to be stored, they should be bundled up and completely buried in moist soil in a cool place, where they should keep perfectly well even for a few weeks.

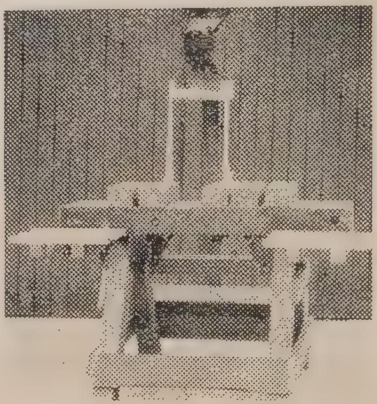
Small fruit growers overseas often maintain a few red currant and gooseberry bushes as stool plants for the purpose of providing cuttings. The plants are cut to the ground each winter to encourage numerous suckers which make longer, straighter cuttings than the new shoots from fruiting bushes. In propagating red currants and gooseberries for stool plants, of course, all the basal buds would be left in place to provide future suckers.

Rooting hormones are effective in accelerating rooting of small fruit cuttings, although it should be pointed out that a high percentage of these cuttings should root even without hormone treatment if they are properly prepared and inserted.

☆

Orchardists' Labour Saver — Case-making Bench

By A. R. GRAINGER, *Orchard Instructor, Christchurch.*

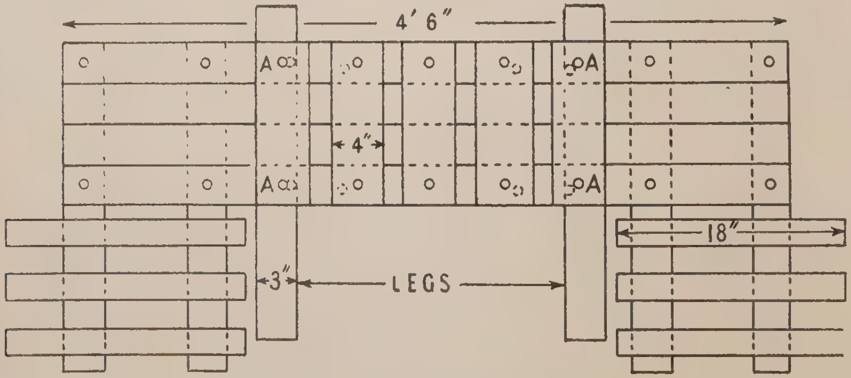


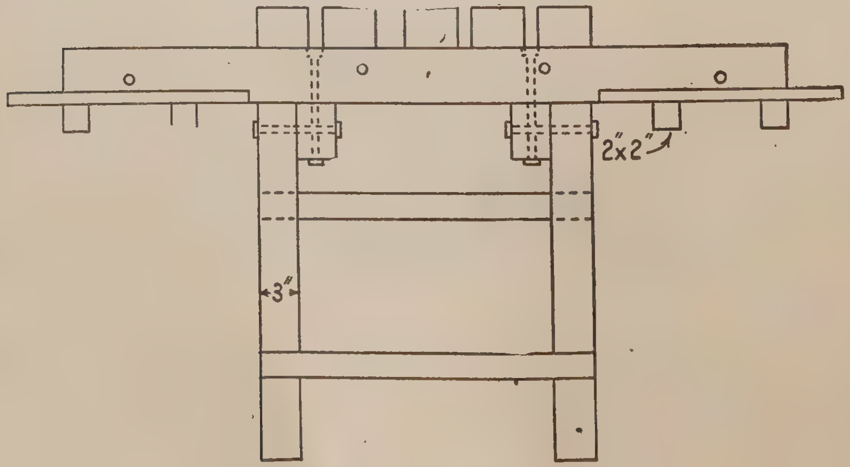
[*Green and Hahn Ltd.*

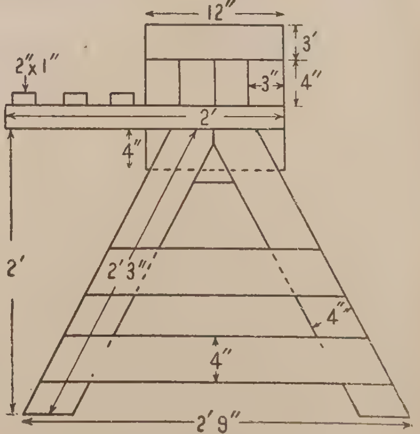
Case-making benches are often moved from place to place in the packing shed, or to the shelter of trees or a "lean-to." They should therefore be light enough to be portable but strong enough to withstand the jar of constant hammering. The bench illustrated meets these requirements.

The upper front leg brace may be omitted, as it is likely to be in the way of the operator.

At A the bolt holes are enlarged as shown so that the space in which the case ends are placed may be adjusted to suit the thickness of the timber. The specification for ends is ⅝in. or ¾in.







The materials required are:—

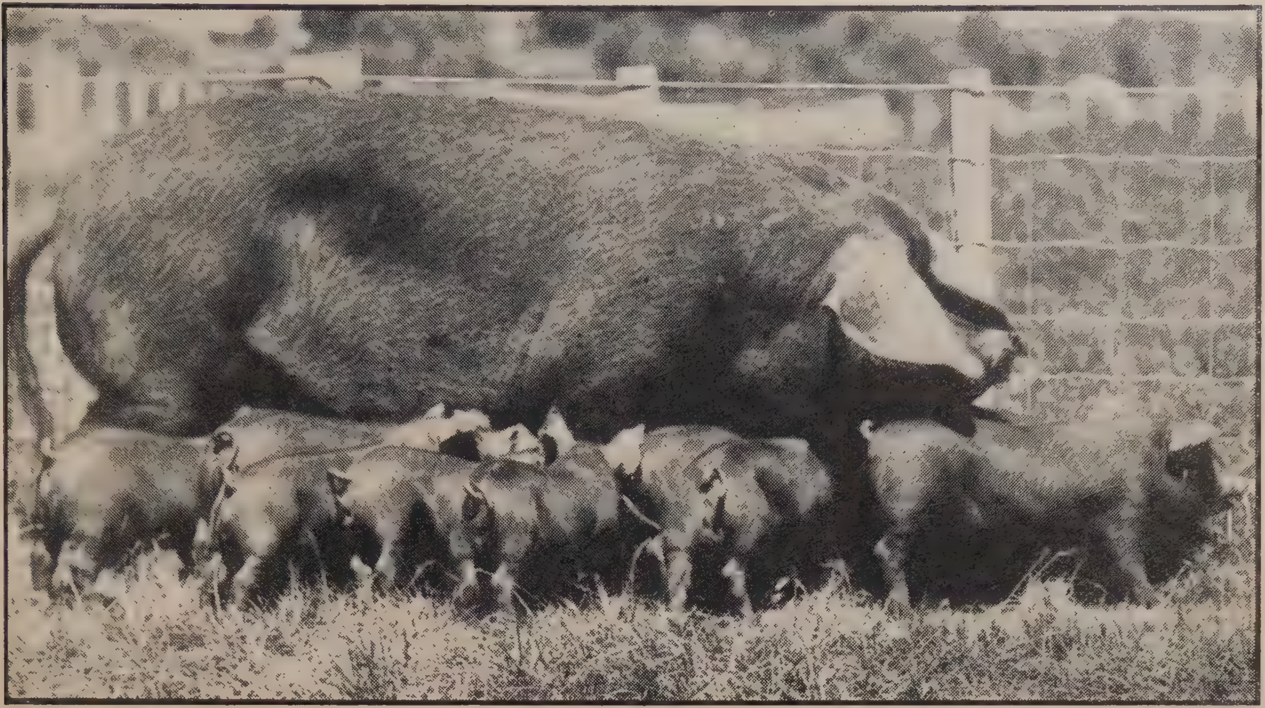
TIMBER

Size (inches)	Number	Length	
4 x 3	4	4ft. 6in.	
4 x 3	4	2ft. 6in.	
4 x 3	7	1ft.	
2 x 2	4	2ft.	
2 x 1	6	1ft. 6in.	
4 x ½	2	2ft. 6in.	end braces
4 x ½	2	2ft.	
8 x ½	3	2ft. 6in.	front and back braces

COACH BOLTS

Size	Number	Length
½in.	12	6½in.
½in.	4	8½in.
½in.	10	7½in.
½in.	4	12in.

MANAGEMENT OF BREEDING SOWS



Gilts Should Be Carefully Selected

SOW management is a fundamental part of pig husbandry which must be improved if full use of breeding stock is to be made and pig production is to be efficient. In this article A. Longwill, Assistant Superintendent of the Pig Industry, Wellington, discusses the requirements of good management and the care of the in-pig gilt or sow.

THE falling off in pig production which has taken place in the last five years has been accompanied by a reduction in the number of sows. This is to be expected, but there is a further serious feature—the number of pigs slaughtered per sow has fallen from 10.5 to slightly less than 9. As the most successful farmers regularly sell 12 to 14 pigs per sow, it is obvious that many sows do not perform well.

One reason for the poor number of pigs sold per sow is that many sows do not farrow two litters a year, although this is recognised by most farmers as essential to efficient pig production. The other reasons are unnecessary delay between time of weaning and getting sows in pig again, disappointing farrowing results, and considerable litter losses after farrowing. Many of these losses could be avoided by better management. The main requirements of good management are:—

1. Selection of gilts from a prolific strain with good mothering and milking ability.
2. Proper development of the gilt before first mating.
3. Need of gilts or sows to be in rising condition at mating, and boar to be in good, active condition.
4. Steady improvement of sow in condition during pregnancy so that she has a reserve of condition on which she can draw during the nursing period.
5. Feeding the nursing sow carefully but adequately according to the number of pigs being suckled. The creep should be used to ensure that the full growth potential of the piglets is exploited without too heavy a strain on the mother and that no check takes place at weaning. Control of worms is particularly needed to ensure that the piglets do not suffer a setback.
6. Weaning by taking the sow away from the litter, but, instead of merely turning her out on grass, continuing to feed her so that she takes the boar within a week after weaning and continues to improve in condition rapidly.

Choice of Breeding Gilts

The average pig farmer who is breeding his own requirements saves most of his gilts from his own stock. Until breeders are in a position to give accurate particulars of the prolificacy and litter-weight production of their stock there is little serious exception that can be taken to this practice, providing the farmer takes into account these two factors in his selection and has an eye for the type which will produce good carcass-quality pigs. It is better still, of course, if he knows from experience of selling his pigs on hooks which strain gives the best grading results.

However, where pedigree stock which have been selected for generations for high prolificacy and good mothering ability can be obtained, the chances of success with them are better than with unselected stock. The pedigree breeder will not persevere for long with strains of stock which fail to have those desirable qualities. A pedigree gilt in pig to a good boar of her own breed can often be purchased for little more than the price of the unselected grade sow. Generally it would be worth while paying this little extra and, if the gilt performs satisfactorily, saving some of the sow pigs to replace any of the less satisfactory or old brood sows which are no longer profitable.

In making the selection of breeding gilts it is necessary to select from a good strain instead of taking outstanding-

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looking pigs from an indifferent strain To do this, the following information, which should cover a large number of pigs of the same pure strain, must be available:

(a) Litter records of all litters by the same sire and all litters of the dam, preferably by different boars. Litter records of other sows bred from the same parents and also of any further back in the pedigree, if available.

The standard should be as follows:

No. Born	No. Weaned	Total Litter Weight	
		At 3 weeks	At 8 weeks
10	9	120lb.	360lb.

(b) Carcass quality and growth rate results for as many pigs as possible of the same breeding and of the same pure strain. These results can be obtained by the breeder either through the Carcass Quality Scheme operated by the Department of Agriculture, or through some carcass or bacon competition. The standards which should be set in examining these results are 100 per cent. prime 1 grade pigs with growth rates up to .7lb. dressed carcass a day or 90 per cent. prime 1 where the growth rate is higher. To examine the results of Carcass Quality Scheme measurements more critically the necessary standards are given below.

Where competition results are available the standard should be set at 70 per cent. of total points, or better.

It is doubtful whether this information will be available for more than one or two strains in New Zealand today, but unless the commercial breeder demands it and is prepared to pay a little extra for proven stock, it is unlikely that he will ever be able to secure such stock and so bring about the desired improvement of breeding stock generally.

Dressed Weight lb.	Maximum Backfat (Unit 1/16in.)		Minimum Length (inches) Internal Body Measurement	Growth Rate (lb. dressed meat gain a day)
	At shoulder	At Loin		
130	20-24	12-13	31	.74
140	21-25	13-14	31½	.75
150	22-26	14-15	32	.77
160	23-27	15-17	32½	.79
170	24-28	16-18	33	.81

Large White boar.

| *Wellington Studios*

A good specimen of Berkshire sow.

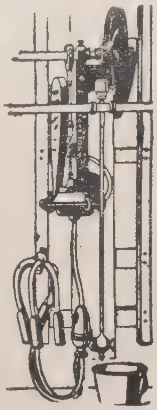
Facilities may some day be available in this country, as they are in Denmark, for breeders to submit their pure strains to tests for commercial qualities under uniform conditions of feeding and management. That is the ultimate basis for selection, but until it is available the most must be made of present-day methods.

In the meantime, even though buyers should ask for the evidence of commercial ability in breeding stock already referred to, they will have to be content with making an eye assessment. Reputable breeders on their knowledge of a strain will advise inexperienced buyers in their selection, and this is always better than judging on appearance alone, no matter how good a judge one may be.

Most farmers, however, prefer to inspect stock before purchasing. Besides looking for sows which are milking well and have good litters and good temperaments they want them to have at least 12 evenly-spaced teats. They also require all pigs of the strain to be lengthy with strong, square back and flat sides, not round in the rib and carrying a larger proportion of weight in the hind end than the fore end (having full hams and relatively-fine shoulders and head). An additional requirement is good legs set straight and wide apart, with strong, short pasterns.

In-pig Sow Management

The gilt or sow should be fit but not fat when she is put to the boar, whose condition should, of course, be similar. The maiden gilt should be well developed, say, 250lb. live weight, before being mated. The development rather than the age should be the guide, although gilts which were runts as piglets should be avoided, and the animal should be in rising condition and be having adequate exercise when it is planned to have her mated. Her condition should continue to improve for at least a month after mating or until she is really fit, and weight increase should then be regulated to the growth of the litter. The total litter at birth and the foetal membranes may weigh 40lb., and this increase in weight of the sow ought to be the minimum aimed at between the stage when condition is deemed to be fit and the date of farrowing. A regular increase of ½ to 2/3lb. live weight a day



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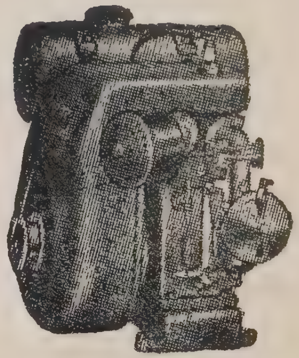

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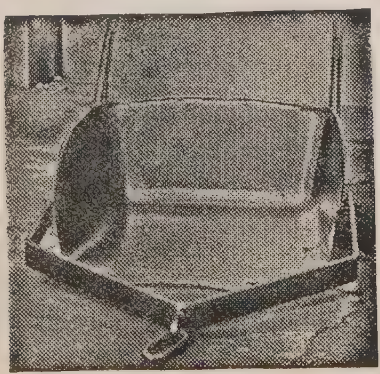

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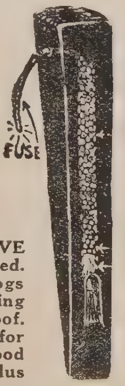

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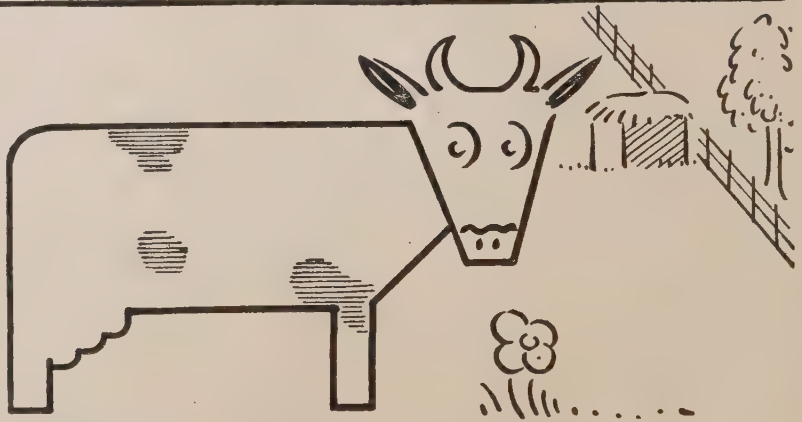

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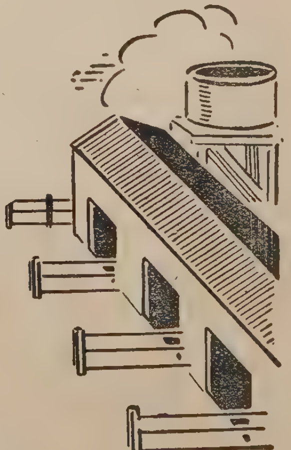

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To get dry sows in fit condition access to free grazing is necessary. Care must be taken, however, to ensure that the diet is sufficiently rich in protein and minerals.

over this period should achieve the desired result and should mean that the sow is given every opportunity to produce to the limit of her inherited capacity.

The quantity of food needed to achieve this gradual increase in the live weight of the sow will vary according to the quality of grazing available at various times of the year and on the ability of the sow to thrive on the grazing or other food she can pick up on free range. Even where quantity is adequate, care is necessary to ensure that the diet is sufficiently rich in protein and minerals. When skim-milk is not available some meat meal should be provided and, if substantial quantities of farm-grown crops, particularly maize or barley, are being used, a mineral supplement should be supplied irrespective of whether one is required to combat any known local mineral deficiencies. To secure rapid weight increase in early pregnancy, 5 to 8 food units a day may be required (1 food unit = 1 gallon of skim-milk or 1lb. of meal) in addition to grazing.

The requirements for the next two months will be considerably lower in the spring months, when grazing alone may suffice, than in the late summer and autumn, when the grass is often so poor that it is almost useless as food for pigs. Under these conditions the sow should be hand fed at least 2 to 3 food units a day. This is of great importance, as an appreciation of this fact and the provision of the necessary supplementary food in the form of meal is necessary if the best results are to be obtained from winter and spring litters. If these litters are disappointing, there is certain to be a shortage of pigs when they are most needed to utilise the flush of dairy by-products. Sow-feeding bails in the dry-sow paddock are valuable to enable individual hand feeding to be carried out; this is necessary if the greedy sow is to be prevented from getting too fat at the expense of weaker sows.

Pre-farrowing Management

For each farrowing a properly-constructed farrowing house with grass run should be available and the sow should be moved into her quarters two or three weeks before she is due to farrow. To enable this to be done a proper service record is a necessary, if distasteful, part of good sow management. The sow will get the grazing on the grass run and at least 1lb. of meat meal a day. Other food will depend on her condition and the time of the year. If there is plenty of milk about (and she will be expected to consume large quantities when rearing the litter), she should get gradually-increasing quantities of milk up to four gallons a day. The dung should be closely watched and if the grazing is not sufficient to keep the sow's bowels regular, a little bran, when available, should be fed. Such feeds as roots, kale or rape, cereals grown for grazing, lucerne meal or the leafy portion of lucerne hay, or a small quantity of linseed-meal or bran are valuable at this time. If little milk or whey is available, the sow should be allowed as much clean water as she will consume.

If under this management the sow tends to be at all sluggish, the ration should be eased off during the week before farrowing, allowing her just sufficient of a fairly bulky ration to satisfy her appetite. She should then be in order for a relatively-easy and quick farrowing. If she is of the right temperament, the handling during this stage should have got the sow quiet, so that she can be attended at farrowing and her piglets can be handled without upsetting her. There will be some difference of opinion on the attention to be given to sows at farrowing time, and most farmers find it difficult to give individual attention. However, it must be agreed that this

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Radio Broadcasts

RADIO talks to farmers will be given from Station 1YA, Auckland, at 7.15 p.m. on the following dates:—

May 5—"Current Farming Problems," by C. R. Taylor, Fields Instructor, Rotorua, and E. R. Marryatt, Fields Instructor, Whakatane.

May 12—"Milking the Cow—Some Popular Fallacies," by W. G. Whittlestone, Animal Research Station, Ruakura.

May 19—"Sweet Blue Lupin in the King Country," by K. M. Montgomery, Fields Instructor, Te Kuiti.

May 26—Young Farmers' Clubs session, by a representative of the Auckland Central Y.F.C. district committee.

is the crucial time when it is very largely determined what "crop" is to be "harvested" from each sow. Therefore there is very good reason for providing properly-designed farrowing quarters and keeping an eye on the sow when she is farrowing. It is fascinating and profitable work and enables one to decide on the true mothering ability of the various sows and use this knowledge in the selection of breeding stock.

Care of the Nursing Sow

There is a temptation to feed the newly-farrowed sow to full capacity, but this should be resisted for at least four or five days after farrowing. The feed should be gradually increased from 6 food units to the amount represented by 6 food units for the sow and 1 food unit for each piglet in her litter. She should be getting the full quantity by the time the litter is three weeks old.

Before this a creep should be arranged for the litter and access thus given the piglets to dry meal and milk or whey in separate, specially-made, low troughs away from the sow. The piglets will almost certainly not clean up the food put in their creep troughs and the food left over should be cleaned out and replaced daily with just sufficient fresh feed which the litter is able to clean up. Creep troughs should be scrubbed at least once a week to ensure cleanliness.

As the amount of food given to the litter is increased that given to the sow may be gradually decreased according to the way she holds her condition. Although the sow will normally lose some condition, she should not be allowed to lose too much. The greatest strain comes on the highest-producing sows and it is with these that the best feeding and management is amply repaid. This applies not only to the nursing period, but also to the dry period. Heavy-producing sows are liable to be hard to get in pig again quickly after weaning a litter if during suckling they are allowed to get thin and are not quickly brought back into condition after weaning. This is undoubtedly the cause of much of the difficulty in keeping up the number of pigs slaughtered per sow.

Provision of Adequate Feed Supply

Securing two litters a year from each sow and feeding the dry sow adequately demand the provision of an ample feed supply for the autumn and winter months. With the present lack of cheap imported concentrates it is essential to provide suitable home-grown food, some of it of concentrate quality, so that sows can be adequately fed.

The question naturally arises whether it is profitable to provide this extra feed. The most careful trials on the feeding of the dry sow in this country show that the extra pigs produced by well-fed sows cost only about 5s. each to the weaner stage at present prices.

With weaners at the price they are every spring, there can be little doubt about the profitability of better sow feeding. There is surely every other incentive to produce more pigs if it is remembered that Britain needs more pig meat and that the Dominion's future good will may depend largely on the quantity of pig meat that is exported in the next year or two.

Times of Farrowings

A point which should be borne in mind is the arranging of farrowing dates to suit the feed supply and the various markets for pigs. In the few cases where feed supply does not fluctuate materially (garbage and offal feeders) farrowings can be fairly uniformly spaced over the season. However, most pigs in this country are produced to utilise dairy by-products and to do this most efficiently with the optimum economic quantity of supplementary feeding, farrowings should be concentrated in the months of May and June (although evenly spaced over the whole of this period). Second litters would then be farrowed in November and December, the object being to make baconers of the first litters and porkers of the second. Where both litters are made into baconers farrowings should be concentrated round the April and October periods, although, of course, more supplementary food will be required for wintering stores from autumn litters.

Where all porkers are produced a wider range of farrowings is desirable than for mixed production of baconers and porkers, but it should be centred round April, May, June, and July, and October, November, December, and January.

Weaner producers should concentrate on the beginning of the period and be prepared to take some of the later litters on to porker weights with the aid of farm-grown crops such as rape or kale, lucerne or cereals as greenfeed, together with grain such as maize or barley according to district.

Conclusion

It is generally agreed that home-bred pigs are more satisfactory than bought pigs and that, provided the farmer gives his breeding stock reasonable care, breeding his own requirements will return him the maximum profit. There is, however, room for considerable thought to be given to improving the management of brood sows, particularly to the feeding of the sow while dry. Even with the reduced number of sows being carried today, an extra 300,000 pigs a year should be produced. The food required to fatten them is available and is simply going to waste at present. This wastage must not be permitted to continue if pig production is to be efficient and if the Dominion's overseas market is to be safeguarded.

Supplementary Payment for Loss of Production in Town Supply Cows

A GOVERNMENT decision to make a payment of £8 a head to cover loss of production suffered by town milk producers through T.B. condemnations of milking cows has been announced.

Under the national milk scheme town milk producers were required through their local associations to give individual guarantees under penalty of a minimum daily production of milk. These guarantees were calculated on the basis of the normal daily yield of milk from the number of milking cows in each herd. Producers faced with a sudden loss of milking cows through condemnations during the contract period could suffer a specific loss under contract conditions which were peculiar to the town milk industry only.

The decision to make a payment covering loss of production does not affect the provisions of the Stock Act, 1908, nor the present basis of compensation in an amendment to the Act embodied in the Statutes Amendment Act of 1945. This amendment made provision for placing a maximum value of £16 a head on any animal condemned for T.B. The full value was not paid in respect of such condemned stock, the farmer receiving only 75 per cent. of the valuation made at the time by the stock inspector.

All payments under the Stock Act will continue to be administered by the Department of Agriculture, whereas this additional payment for loss of production will be administered through the Milk Marketing Division and will apply to all town milk producers who are members of supply associations and also to licensed producer-vendors. This special payment is restricted to condemnations covered by the period October 1, 1946, to March 31, 1948, during which time it is anticipated a substantial amount of tuberculin testing of town supply herds will have been carried out.

FARMING IN NEW ZEALAND

Cereal Production

By

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FOR a period in the 70's and 80's of last century it appeared that large-scale wheat farming might form part of the farming pattern of Canterbury and portions of Otago. This article traces the rise of these bonanza wheat farms and their subsequent decline.

THE small communities of early settlers in New Zealand were cut off from one another by bush and natural barriers of mountain and river; in addition communication with Australia, the nearest overseas neighbour, was infrequent, and the Mother Country was several months away. It was thus inevitable that to live these pioneers had to concern themselves with subsistence farming; they had to produce and process the greater part of their requirements, and it is not surprising that to ensure the supply of their daily bread they made wheat their principal crop. From the North Auckland mission farms down to John Jones, whaler and farmer, at Waikouaiti, Otago, each small settlement had its wheat crops; in fact up to the 60's wheat was grown in parts where it has never since been attempted.

The first settlers in Canterbury, which was to become the granary of New Zealand, immediately turned their attention to wheat growing. All through the 1840's Mr. Hay, of Pigeon Bay, Banks Peninsula, "grew wheat, cut it with a reaping hook, threshed it with a flail, and ground it at night or on a wet day." The Deans Brothers at Riccarton grew their first grain crops in 1843-44, consisting of 2½ acres of wheat, 1 acre of oats, and 2½ acres of barley, but as the seed was sown too late the crops were light. However, the following season the wheat crop of 26 acres which followed a crop of potatoes yielded between 60 and 70 bushels an acre.

It was after the arrival of the first organised settlers in Otago and Canterbury in 1848 and 1850 respectively that the area sown in wheat increased rapidly. The fertile plains and rolling downlands of Canterbury and Otago required little breaking in. There were few natural difficulties to contend with, such as bush to fell and large areas of swamp to drain, and the settlers were able immediately to set about the task of cultivating the soil.

In the second year of the Canterbury settlement's history there were 500 acres sown within a short radius of Christchurch, and by 1855 the total wheat area of the country was 10,000 acres. For example, in 1853 Mr. W. G. Brittain, Commissioner of the Canterbury Association's Lands, gave some details of a crop which he grew on a piece of land close to the present Barbadoes Street Bridge in Christchurch. "I had 13 acres laid down to wheat. The land, which was originally covered with tutu, fern, and grass, had been broken up the previous year and had borne a first crop partly of wheat and partly potatoes. The land was ploughed about the latter end of March and remained fallow until the last week in May, when, having been first lightly harrowed, it was sown with wheat, broadcast with 2 bushels to the acre. The soil being very light, the plough followed the sower and covered the seed to a depth of about 3in. In the spring, when the young wheat was about 2in. above the ground, it was well rolled with a heavy horse roller. The crop threshed at 70 bushels to the acre."

Effect of Gold Rushes

While the Otago gold rushes of the early 60's practically brought agricultural farming to a standstill for a time, they had the effect of bringing a valuable addition to the population. In 1860 the European population of New Zealand was at 80,000; five years later it reached 191,000, the greater proportion of the increase going to the South Island, because parts of the North Island were hampered in their development by the insecurity caused by the Maori Wars.

The increased population affected the market for farm produce within New Zealand, and Canterbury benefited particularly, because it was from here that the flour, meat, and butter were obtained which brought such high prices on the Otago goldfields. In Dunedin flour rose to £52 a ton, butter to 2s 6d. a lb., and they were much higher at Tuapeka, on the actual "fields." It is said that here a pannikin of flour cost 5s.

The period of stagnation following the gold rushes was comparatively short lived; the decline in the wheat acreage in the 60's quickly recovered and in the 70's great progress and the rise of the bonanza wheat farms occurred.

AREA IN WHEAT, OATS, AND BARLEY IN CANTERBURY AND OTAGO

(To the nearest thousand acres.)

YEAR		WHEAT Acres (thousands)	OATS Acres (thousands)	BARLEY Acres (thousands)
1858	..	6	5	.8
1861	..	18	9	2
1864	..	19	41	3
1870	..	73	82	22
1875	..	98	145	13
1880	..	248	297	47
1885	..	247	325	30
1890	..	294	376	23
1895	..	139	312	25
1900	..	243	347	31

The table shows a large increase in the acreage in cereals in the 80's. This was during the first prolonged economic depression in New Zealand, when, as in subsequent depressions, some farmers turned their attention to the production of cash crops such as cereals and unfortunately, in a number of instances, to mining the soil. During the depression of the 1930's there was a repetition of this; the wheat acreage increased in spite of low prices because of farmers' endeavours to maintain their income to meet relatively-high fixed charges, and soil mining was again frequently resorted to.

RISE OF BONANZA WHEAT FARMS . . .

Bonanza wheat farms, which depended largely on the export of their product, could not have developed without the extension of the railway system and the development which had taken place in the machinery to do the work—ploughs to turn the furrow and machines to facilitate the cutting and threshing of the grain.

There was another factor which had a direct influence on their rise. Up to the beginning of the 80's New Zealand depended to a large extent on one industry, the production of wool, but in 1879 the price for this commodity, which had been as high as 24d. a lb. following the Franco-Prussian War of 1870, fell to 4d. a lb. As a result of this fall and the continued low price, some farmers turned their attention to other sources of income, the production of grain being the major one.

The first railway line built in New Zealand was completed in 1863 from Christchurch to Ferrymeade, a distance of 5 miles. By 1868 there were 30 miles of line in Canterbury and by 1875 180 miles, which was over 30 per cent. of the total railway mileage of the country. The main south railway reached to the north bank of the Rangitata River and served a considerable portion of the 70,000-acre wheat area of that time.

New Zealand farmers have always been quick to take advantage of any mechanical appliances; sometimes, of course, they have been forced into purchasing the equipment because of the difficulty of obtaining labour. Mrs. John Deans, sen., in a letter to the Canterbury A. and P. Association in 1882 mentioned the position in the 1850's. "Owing to the Australian gold diggings attracting labourers of all classes from New Zealand and elsewhere the first two years after my husband's death, the late Douglas Graham, manager of Riccarton farm, had great difficulty in securing the harvest of 1855-56, so that the trustees decided on importing a reaping machine. My brother-in-law, Mr. J. D. Deans, on making inquiries in the Old Country as to the best in those days, sent us a 'Bell's Improved.' It was so heavy two horses could push it for only two hours at a time, when they had to be replaced by others."

Sickle and Flail: 1850-1860

Development in the mechanisation of agriculture in Canterbury can be divided broadly into the following periods:—

1850-1860—Sickle and flail.
1860-1870—Reaping machines.
1870-1880—Double-furrow ploughs and wire binders.
1880-1890—Grain drills and twine binders.

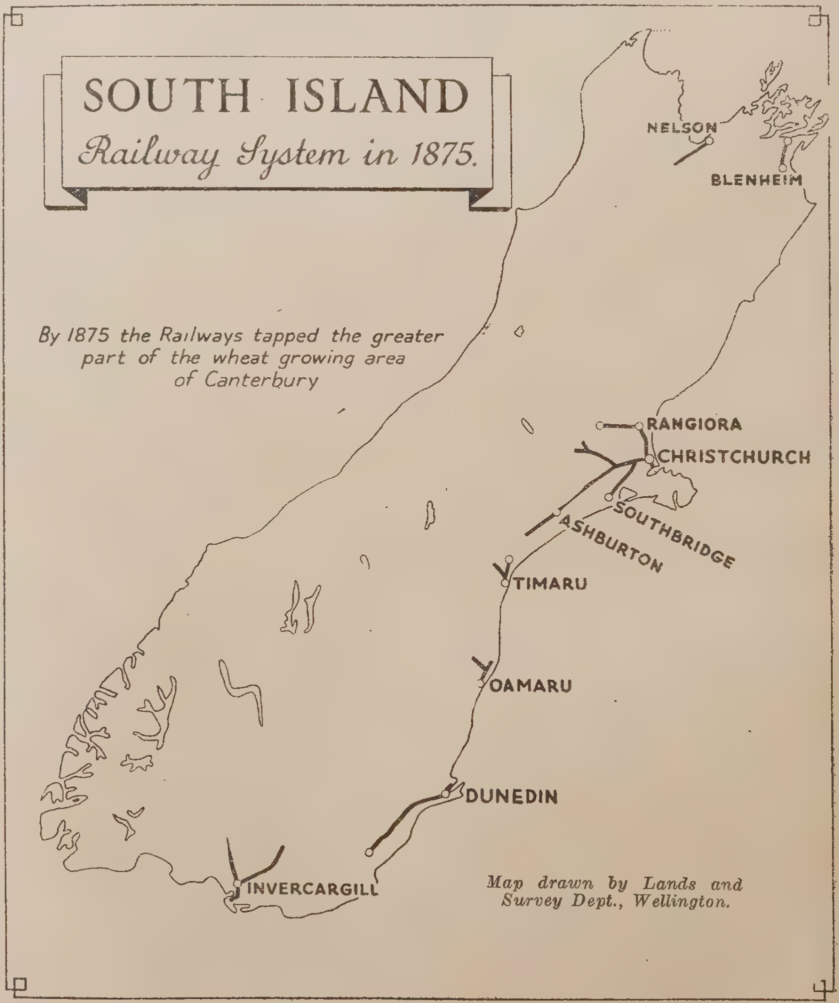
As Mr. Studholme points out in his book "Te Waimate," the years 1850 to 1860 can generally be described as the manpower period, the main implements being spades, shovels, picks, hoes, sickles, and flails. However, single-furrow ploughs were fairly common, and by 1860 it is estimated that there were about 250 on the Canterbury Plains. There were also a few reaping machines and horse-driven threshing machines.

A favourite plough was the John Barrowman swing plough, which was successful in the first ploughing matches held at Christchurch, and one merchant at Lyttelton in 1855, when notifying clients of the expected arrival of this make, capitalised on this by stating that their superiority required no comment, as they had taken first prizes at ploughing matches at Christchurch for two years successively.

Bullocks were generally used in the ploughs, and the man who could take an even furrow across a field with the old Barrowman hitched to bullocks was certainly well trained in hand and eye. As the bullocks crawled along chewing their cuds his patience must have been tried, too, all his encouragement and punishment of the beasts doing little to make their pace smarter.

The grain was sown broadcast, the sower usually carrying half a bushel in a sack receptacle attached to a frame around the waist. A skilled man could sow 25 acres a day, and some men who sowed on contract have been known to sow as much as 1000 acres in a season; so skilful were the sowers that they could gauge accurately the amount to be sown per acre. By sowing broadcast on well-made furrows and giving one stroke of the harrows the wheat came up in rows as straight as those made today with a drill behind a tractor.

The cutting of the grain was generally done by sickles and scythes, but in a few cases reapers were used. The sheaves were tied by hand and the threshing done either by flails or small horse-driven threshing machines, a make used a little at this time being the "Kettle Drum Thresher," which comprised a small drum revolved by


SOUTH ISLAND
Railway System in 1875.

Map drawn by Lands and Survey Dept., Wellington.

horses working a capstan. The horses ran round at a jog trot while the driver stood on the capstan and used his whip to keep the animals moving at a good pace.

Reaping Machines: 1860-1870

During the decade 1860-1870 full use was made of the single-furrow plough; rollers made of a sizeable log of wood and wooden-framed tine harrows also began to be used. In North Canterbury, where there are limestone deposits, a number of rollers were cut from limestone blocks.

Reaping machines were extensively used, and by 1870 there were about 800 at work in Canterbury. A make popular at this time was the Burgess and Kay, and there were some McCormicks. As the crop was cut by the Burgess and Kay machine it fell on to a platform and was raked off in sheaves by a man walking or riding behind. In a heavy crop the work was particularly arduous. The knives frequently blocked, and even in a light crop the machine did not cut well and missed a lot, but in spite of this its introduction was a great advance on the scythe and sickle of the previous decade.

Later in the decade the Samuelson side delivery appeared. Sheaves, of course, still had to be hand tied, the charge for this usually being about 10s. an acre.

This period also saw the introduction of the portable steam engine and combine for threshing, one of the first of these plants being imported in 1865 by Messrs. Osborne and Rennie, who worked it at Prebbleton, about eight miles out of Christchurch. They made a charge of 9d. a bushel for threshing, later reducing it to 6d. a bushel. It is rather appropriate that Osborne's son was the first to introduce a header harvester in 1927. However, threshing was still largely done by horse power, and although there were some mechanical sowers, hand sowing was the rule.

Double-furrow Plough and Wire Binder: 1870-1880

Great advances in agricultural mechanisation were made during 1870-1880, the most outstanding being the introduction of the double-furrow plough drawn by three or four horses. This plough was the foundation-stone of arable farming in New Zealand, for without it men like John Grigg could not have created out of the Longbeach swamp his famous large-scale arable farm. It now became possible with a four-horse team to turn over between 3½ and 4 acres of land a day.

The New Zealand double-furrow plough has altered very little in essential details since it was first designed by Mr. Pirie, an Aberdeenshire mechanic, about 1870. He embodied an entirely new principle by carrying the plough on three wheels, one on the land and two bevelled ones in the angle of the furrow, and by dispensing with both sole and side plates. The absence of sole and side plates lessened friction, lightened draught, and greatly reduced the glazing of the bottom of the furrow and the development of a plough pan. The pitch to the land (which was previously obtained in ploughs through the inclination of share to side plates) was obtained by giving to the land and rear-furrow wheels a slight inclination to the "land."

[Green and Hahn Ltd.

There were about 250 single-furrow ploughs on the Canterbury Plains by 1850. A favourite make was the John Barrowman.

As is sometimes the case, the invention did not prove a boon to the country of origin, and Mr. Pirie's name is probably forgotten among Scottish farmers. A New Zealand visitor to Scotland in 1878, when writing to a friend in Canterbury, made the following comment. "You will agree that no implements so revolutionised farming in New Zealand as the two-furrow plough and the large harrows; in fact the capability of one man to do the work of two has had a great deal to do with the advance of agriculture with you, the saving often permitting a fair profit when none would have otherwise existed. Now in Scotland the double-furrow plough is in most instances abandoned and the old single-furrow plough is everywhere to be seen. I have made many inquiries as to the cause of this return to the implement of former days, and am generally told that double-furrow ploughs require three horses, and those horses are heavily worked. A man is here only willing to look after two horses, and he has a lot of carting to do; consequently double-furrow ploughs disarrange the system and, save in exceptional instances, are a questionable advantage."

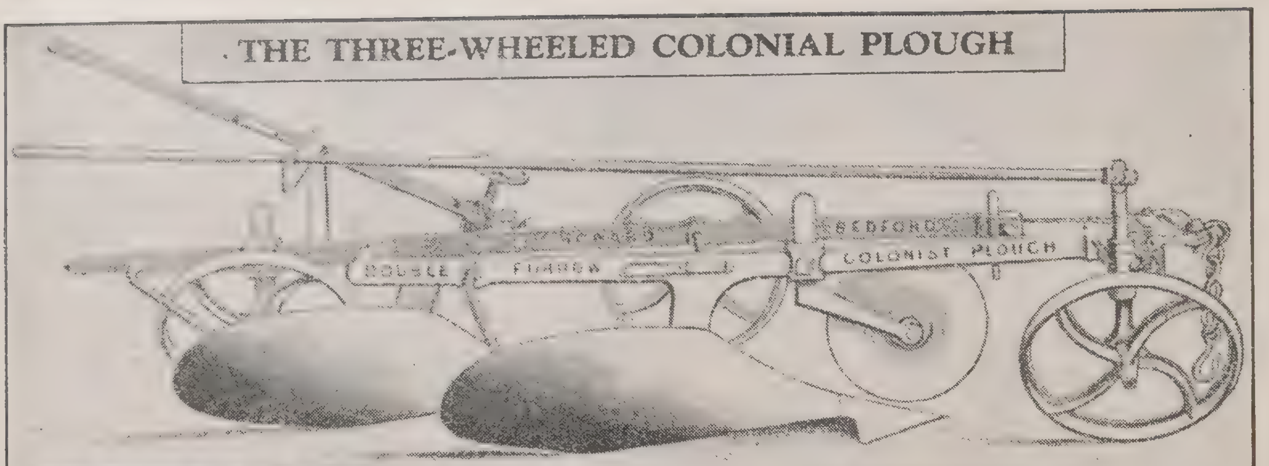
Although Pirie's native Scotland did not adopt the double-furrow plough, it became the standard implement in New Zealand, where its combination of strength and easy draught was invaluable in large-scale cultivation work. Double-furrow ploughs and four-horse teams in blocks became the common cultivation unit on arable farms; later the double-furrow walking plough was replaced by the three-furrow riding plough and six-horse team, which remained the dominant power unit until the late 1920's. Then the tractor began slowly to replace the horse, but the essential features of the early double-furrow plough are still retained in the modern four-furrow tractor plough. New Zealand owes a debt to Pirie of Kinmundy, who thought out an entirely new principle in ploughs.

The first double-furrow ploughs used in this country were English and Scottish ploughs, but some of them proved rather light for New Zealand conditions, and local manufacturers soon turned their hand to the task of plough making. At ploughing matches in the 70's local implements began to predominate. Messrs. Reid and Gray, really an offshoot of a well-known Scottish plough manufacturer, John Gray and Co., commenced business in Oamaru in 1868 and later in Dunedin, and about the same time Messrs. P. and D. Duncan commenced in Christchurch.

The ploughs turned out by these firms were to become well known throughout both New Zealand and Australia, and their implements have gone even further afield. Even during the past few months agricultural implements from local manufacturers have been sent to countries of Europe and the Far East to assist in the re-establishment of their agriculture after the war.

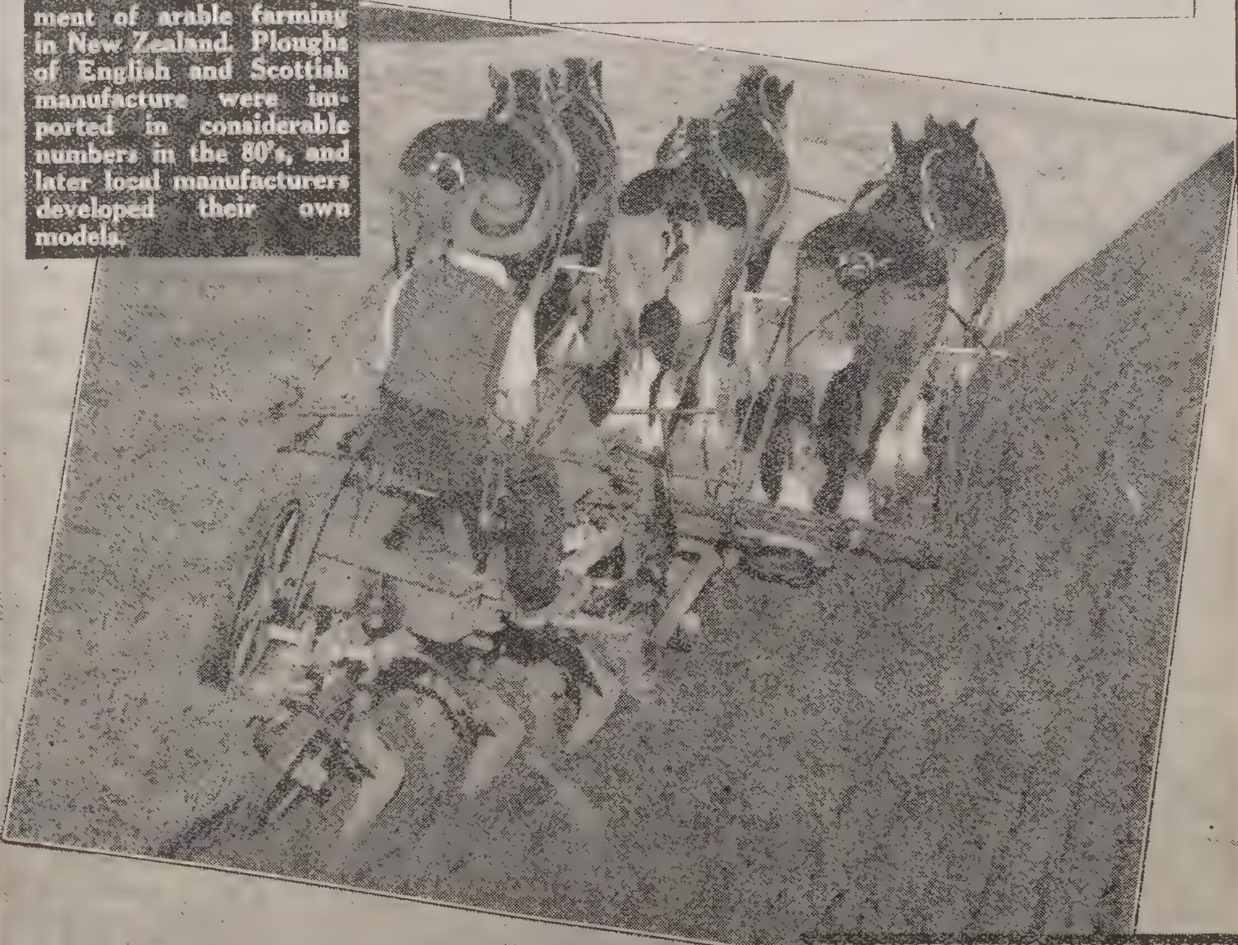
Duncans' made their first single-furrow plough about 1868 and their double-furrow ploughs took part in ploughing matches in the early 70's;

THE THREE-WHEELED COLONIAL PLOUGH



The use of the three-wheeled colonial double-furrow plough invented by an Aberdeenshire mechanic was an essential feature of the development of arable farming in New Zealand. Ploughs of English and Scottish manufacture were imported in considerable numbers in the 80's, and later local manufacturers developed their own models.

THE DOUBLE-FURROW PLOUGH IS THE FOUNDATION OF ARABLE FARMING IN NEW ZEALAND. THE FIRST DOUBLE-FURROW PLOUGHS USED WERE OF ENGLISH AND SCOTTISH MANUFACTURE.



THE THREE-FURROW RIDING PLOUGH AND SIX-HORSE TEAM REMAINED THE DOMINANT POWER UNIT UNTIL THE LATE 1920'S.

another local maker of both single- and double-furrow ploughs at this time was Keetley, of Kaiapoi. In the 70's Messrs. Reid and Gray made their first double-furrow ploughs, modelled on the Scottish plough manufactured by John Gray and Co.

There also began to be used in the field during this decade some Scottish broadcast sowers, Cambridge rollers, and threshing machines worked by portable engines; some reapers and binders were used toward the latter part of the period.

The scene was now set for the bonanza wheat farms to develop. The acreage of the colony sown in cereals increased rapidly; in 1870-71 it was 78,000, and by 1878-79 it had reached 265,000 acres.

The reapers and binders were the wire binding type, the first one, a Woods, appearing in 1877. The size of the sheaves was regulated by the operator, and carelessness on his part resulted in sheaves of all sizes, making stooking and stacking troublesome. These machines threw the sheaves so far that if they were operated close to fences sheaves might be shot into the next paddock. Although an improvement on the reapers, they were not satisfactory, as small pieces of wire invariably got into the straw after threshing, with disastrous results to stock feeding on the straw.

During the latter part of the decade the itinerant threshing plant with a portable engine, combine, and elevator also made its appearance. The engine was usually drawn by four to six horses, the combine by four horses, and the elevator by two, these having to be supplied by the farmers for whom the threshing was done.

Grain Drills and Twine Binders: 1880-1890

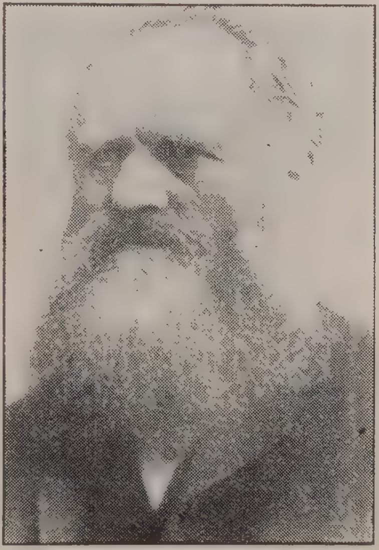
Extended use was made during 1880 to 1890 of the three-furrow plough with the six-horse team, and the spoon-fed coulter drill for sowing was also introduced. The first American grain drill, a McSherry, made its appearance in 1877. The wire reaper and binder was replaced by the twine binder and the traction engine was replacing the portable engine. The traction engine drawing the combine and portable whares for the threshing crew was to become a familiar sight on the Canterbury roads. One of these threshing plants could put through 2000 bushels a day compared with the daily maximum of 200 bushels of the horse-driven thresher.

Up to this time wheat was usually left in stooks for a fortnight and then stacked, where it remained for at least six weeks until a threshing plant came to the farm. About 1890 the first attempt at threshing direct from the stook was made in the Leeston district. After that stook threshing became common, although all farmers could not take advantage of it because of the time they had to wait until the threshing plant arrived. Today, with the use of the header harvester (there were 916 working in Canterbury during the 1945-46 season), the pleasing sight of groups of well-made stacks of wheat dotted throughout the grain-growing area has become much less common. The building of these stacks to ensure that the most driving rain would not penetrate them was a source of great pride to those skilled in their construction.

After the 90's there were few further major developments in farm machinery used for cereal production until the appearance of the tractor, followed by the tin mill, and recently the header harvester.

BONANZA WHEAT FARMS

The demand for cheap bread for the industrial workers of Europe was met by the exploitation of the stored fertility of the natural grasslands of the New World. Large wheat farms developed in the United States, Canada, Australia, and New Zealand, and the term "bonanza" farm applied to them in the United States was later adopted for similar enterprises in New Zealand. Some of the better-known bonanza farms in New Zealand were those of John Grigg of Longbeach, Duncan Cameron of Methven, Studholme Brothers of "Te Waimate," and the New Zealand and Australian Land Company.



Mr. John Grigg of Longbeach.

John Grigg of Longbeach

John Grigg, after selling a farm he inherited from his father in Cornwall, left England at the age of 25 for Australia, where, after spending six months, he came on to try his fortune in New Zealand. His first farming venture in the new country was in the Auckland Province, where for a period he grew potatoes on a large scale for export to Australia, but this proved unremunerative, and he next turned his attention to the supply of hay to the Army during the Maori Wars and then to sheep farming.

His next move was to Canterbury, where in 1864 he purchased Longbeach, a property then comprising 32,000 acres, where at first he ran cattle. Longbeach not only became famous as a large, well-conducted mixed farm, but on it a number of farmers scattered throughout New Zealand served their farm apprenticeship in the colonies, and many tales have been told by these men of the magnitude of the task of running this historic property, which must take pride of place among the agricultural farms of New Zealand. A former Prime Minister, the late William Massey, laboured on the estate for a time.

When it was taken up Longbeach was a swamp covered with native flax, toi-toi, raupo, and niggerheads, and the area was marked on some early Canterbury maps as a "valueless bog." It must have taken a great deal of courage to take up this land, but no doubt Grigg visualised what could be done. Realising that drainage was the first essential, he set about the task in his characteristic manner. He had surveyors determine the levels and then constructed main drains varying in depth from 2ft. to over 10ft. and afterwards installed tile drains.

Thousands of drain pipes were necessary, and to enable the work to be finished satisfactorily he erected a brick works on the property in 1887. These works turned out about 1,000,000 drain pipes for use on nearly 150 miles of drains. The same works also manufactured the bricks for the Longbeach homestead, which was gutted by fire in 1937, but many of the bricks were salvaged and used in building the new homestead. The architect for the new home intended to whitewash the brickwork, but the colour and texture of the second-hand bricks was so good that this decision was vetoed. The work of the Cornish brickmaker brought out by Grigg has thus proved its worth.

After the construction of the main drains the land was left in its natural condition for two years, when clover and grass seed were broadcast.

The area was gradually brought in, but up to 1869 only cattle were run on the property, these being used to consolidate the ground. In that year 5000 sheep were bought, and as the drainage work was completed areas were devoted to cropping. In the

HORSE TEAMS

Three- and four-horse teams were the power units on the "bonanza" wheat farms, when 20 or more double-furrow ploughs often worked in one field. While the teamsters were employed at distant parts of the farm the men and horses were camped at the scene of operations.

season 1879-1880 about 3000 acres were in grain, which yielded 100,000 bushels, 1400 acres were in mangolds, 300 acres in field peas, and 300 acres were cut for hay.

At this period it was not uncommon to see as many as 22 double-furrow ploughs at work in one huge paddock. While the farm workers were employed at distant parts of the farm, during either harvest time or ploughing, the men and horses camped on the scene of operations accompanied by the necessary cookhouse. The annual labour bill was then about £8000.

In 1891-92 there were 4600 acres in wheat, 2100 acres in oats, and 280 acres in barley. The wheat averaged 37 bushels an acre and the oats 60 bushels an acre.

The cost per acre of producing the wheat was given as follows:—

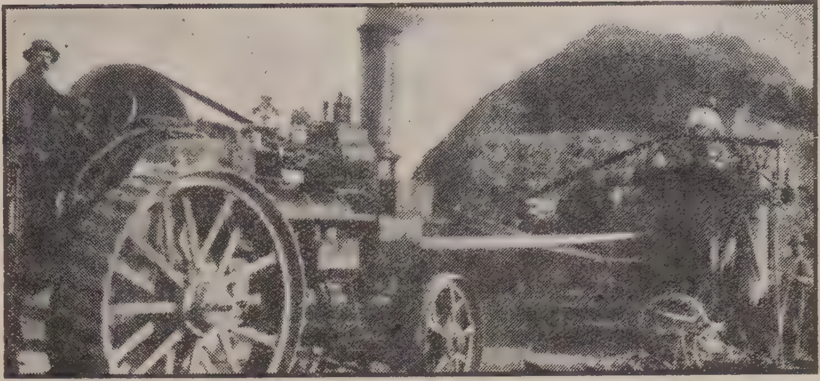
	s.	d.
Ploughing (by contract)	5	0
Rolling		10
Disc harrowing		10
Tine harrowing		9
Drilling	1	6
Seed (1 bushel an acre)	3	0
Spring rolling		10
Harvesting (contract price)	14	0
Threshing with own mill	5	5
Carriage to port and loss on bags ..	15	5
	£2 7	7

This worked out 1s. 3½d. a bushel.

Mr. John Brown in his book "History of Ashburton" gives a description of the position in 1896. By this time the estate had decreased to 14,000 acres, but even then the permanent employees on the farm were between 160 and 170. To provide bread for this number the bakers employed on the property were turning out each week 1000 4lb. loaves and the butchers were killing on an average 150 sheep a week.

Thirty-three reapers and binders were used, and four threshing mills threshed the grain from 3047 acres of wheat, 1780 acres of oats, 700 acres of barley, and 274 acres of peas. The grain was carted to a shed owned by Mr. Grigg at the Winslow Railway Siding, and it is said that £5000 barely covered the yearly freight charges to the Railways Department. The carting to the railway was first done by horse-drawn wagons, each wagon taking about 45 four-bushel sacks of grain, but later traction engines were purchased and these with their rake of trucks did the work.

One block of 1500 acres of wheat in 1896 was expected to average 40 bushels an acre. Up to 24 reapers and binders have been used in one field, and to ensure that delays as a result of breakdown were few a mechanic remained in the paddock so that any reaper and binder developing minor faults could be repaired at once and again take its place in the line.



The traction engine began to replace the portable engine for threshing mills during the 80's.

A large unit of this type in those times required to be serviced within its own boundaries, and there were on the property a bakehouse, flourmill, blacksmith's shop, saddler's shop, carpenter's shop, and fellmongery, besides a well-stocked store where the employees could purchase the greater part of their requirements, and in which a Post Office was incorporated. The educational needs of the families were also catered for by a school on the estate, and a church on the farm looked after their spiritual welfare.

Although the farm seems to be best known as a bonanza wheat farm, stock raising was not just a sideline, and large flocks were always carried. John Grigg played a leading part in the development of the freezing industry, and was a foundation director of the first freezing company to operate in Canterbury. He was also interested in the dairy industry, and the Longbeach Dutch Friesians became well known throughout New Zealand. He was the first to import this breed into the country in 1884, on the recommendation of his son, who, on completing his course at Cambridge University, went to Europe and at an agricultural show at Hamburg saw what he thought to be the ideal "dual-purpose" cows. Subsequently he purchased the two-year-old third prize winning bull, and later from Groningen in North Holland acquired two cows and four heifers. Difficulty was experienced in getting the animals to New Zealand, as they were not allowed to be landed in England. To overcome the impasse the boat from Antwerp pulled alongside the outward-bound boat to New Zealand in the English Channel and there made the transfer. By 1893, 60 cows were milked on the estate, these being in charge of a manager who, with his wife and two boys, did the milking. The wife at times made up over 750lb. of butter in a week.

Close to Longbeach, at Flemington, the third dairy factory in the colony began operations in 1882, and when it failed a few years later it was acquired by Mr. Grigg, who after a few years disposed of it to a Mr. Bond. Thus there were few phases of New Zealand farming in which he did not take a prominent part.

When, his creative work well done, he died in 1901 and was buried in the Longbeach churchyard, the county of Ashburton perpetuated his memory by erecting in the square of the borough a fine statue, now surrounded by beautiful shrubs. When his son, J. C. N. Grigg, died in 1926, he left £500 to the Mayor and councillors of Ashburton in trust for the upkeep of the statue, any surplus income to be devoted toward the provision of an agricultural scholarship or prizes.

This is one monument to his memory, but the greatest remains: Longbeach is still one of the finest estates in the Dominion, and still in the hands of a Grigg.

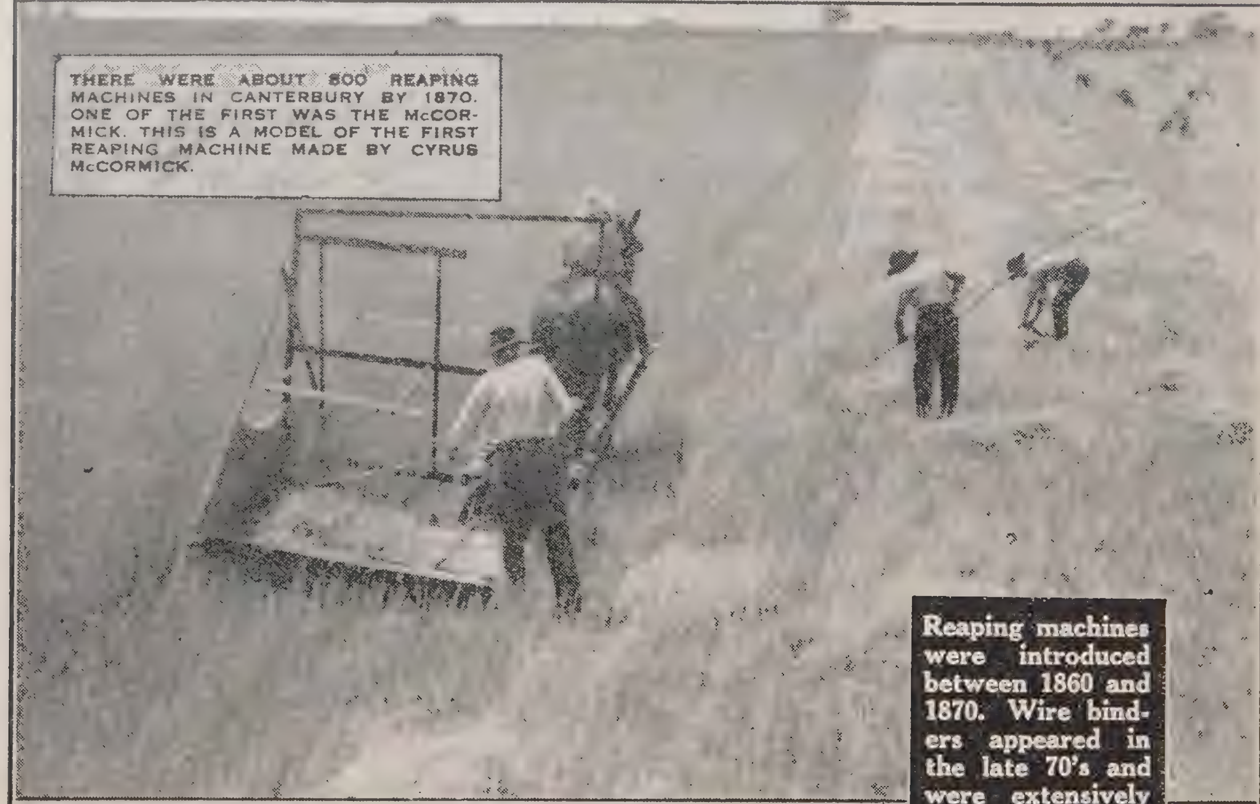
Duncan Cameron of Springfield, Methven

While John Grigg was grappling with the problem of draining Longbeach, a Scotsman in the same county but on the north side of the Ashburton River and nearer the foothills was creating another large mixed farming unit, but here his difficulty was to obtain sufficient water. This was Duncan Cameron, an Invernesshire man who arrived in New Zealand in 1864.

In 1869 he and Mr. George Gould purchased the Springfield Estate, of 21,000 acres, at Methven, which was originally held from the Crown as a grazing run by Messrs. Hill and Bray. The partnership continued until Mr. Gould's death in 1889, and in the following year Cameron bought Gould's share from the trustees for £65,000.

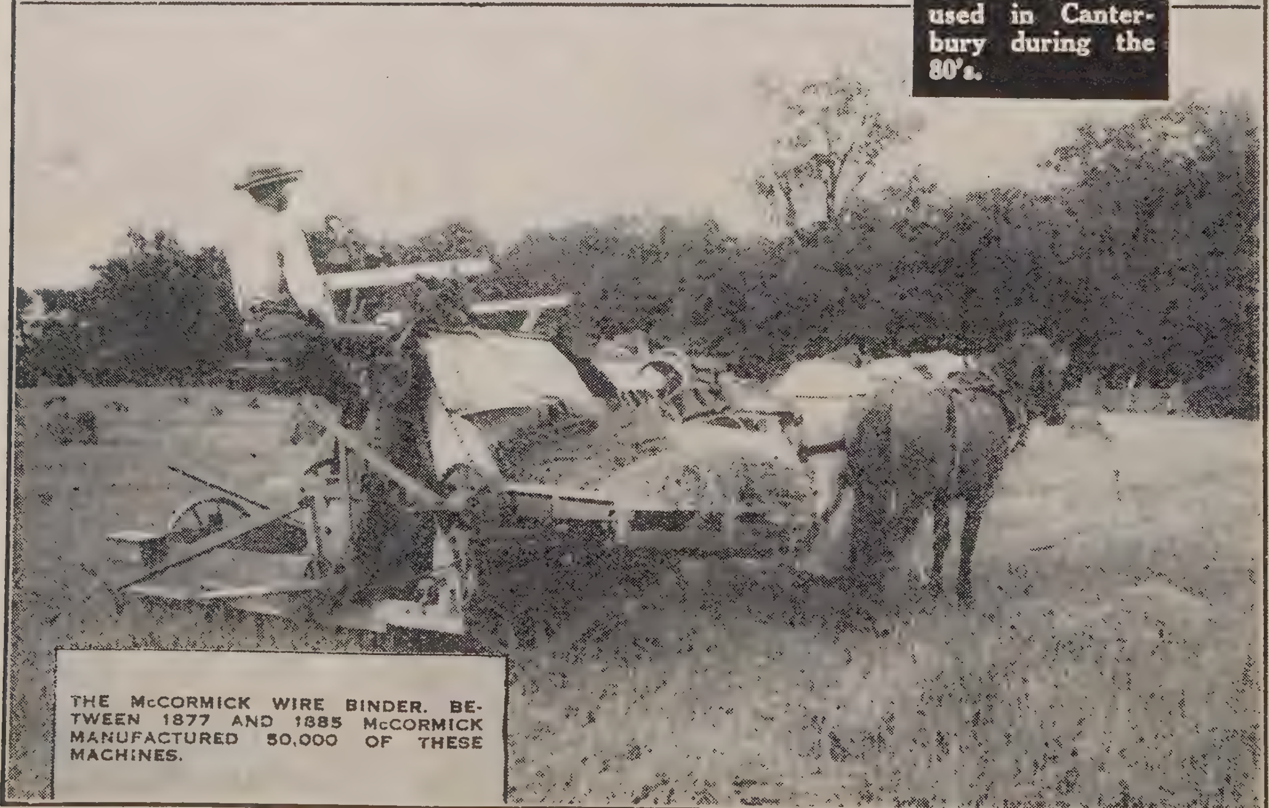
The area was particularly dry, and in the 70's Cameron set about

DEVELOPMENT OF HARVESTING MACHINERY



THERE WERE ABOUT 500 REAPING MACHINES IN CANTERBURY BY 1870. ONE OF THE FIRST WAS THE McCORMICK. THIS IS A MODEL OF THE FIRST REAPING MACHINE MADE BY CYRUS McCORMICK.

Reaping machines were introduced between 1860 and 1870. Wire binders appeared in the late 70's and were extensively used in Canterbury during the 80's.



THE McCORMICK WIRE BINDER. BETWEEN 1877 AND 1885 McCORMICK MANUFACTURED 50,000 OF THESE MACHINES.

the task of bringing water on to the farm, first by constructing a main drain 13 miles in length with its intake at the upper end of the plains, and by 1880 he had 40 miles of races through the area. He was told by some that it would be impossible to get water to run the long distances along the shingly courses, but he carried on with the work and confounded his critics.

Like his contemporary at Longbeach, his yearly programme was a large one, about 4000 acres being in grain crops, and it is said that in 1894 he had 5500 acres in wheat.

To enable the great amount of cultivation work to be done the teamsters did not all live at the homestead; the main stables were there, but there were other outlying camps, one near Methven and two at other points, where the teams were stabled and the teamsters lived.

In the heyday of wheat growing at Springfield 35 reapers and binders were at work, and a photograph in the A. and P. Association rooms at Ashburton shows 23 working in one field. With such good land well farmed, yields up to 60 bushels an acre were common. There were about 100 regular employees on the property and during harvest time this number was doubled.

To provide storage for the large quantity of grain grown a grain store capable of holding 90,000 bushels was erected at the Lyndhurst Railway Siding; this shed is now owned by one of the stock and station companies.

Springfield also carried a large number of sheep, and toward the latter part of Cameron's regime the flock numbered about 15,000.

Cameron died in 1908 and, as befitted a Highland gentleman, he was laid to rest at Methven to a lament played by pipers.

Studholmes of Te Waimate

In South Canterbury, Te Waimate, although not so well known for its cropping activities, devoted considerable areas to cereal production.

The property taken up in 1854 by Studholme Brothers was added to until in the early 80's it comprised 46,000 acres of freehold and 20,000 acres of leasehold, and carried 82,000 sheep, 2500 cattle, and 350 horses. It was during this period that about 4000 acres a year were used for cropping and up to 300 men were employed at harvest time. It is said that in 1883 in the Willowbridge section of the holding (now well known as a potato-growing area) there was one field of 3500 acres in wheat and another of 1200 acres in oats, and in one season 175,000 bushels of wheat were grown, most of it being shipped to England in two sailing vessels.

Te Waimate included some very rich river silt and yields obtained were particularly good. One crop of 250 acres of wheat is recorded as having yielded a little over 60 bushels an acre, and a small area of 13 acres averaged 110 bushels an acre. This land today yields potatoes at an average of 12 tons an acre.

N.Z. and Australian Land Co.

The New Zealand and Australian Land Company is best known for the part some of its officers played in the development of the New Zealand frozen meat trade, but on some of its holdings in Canterbury it was an extensive cereal producer. The holdings in Canterbury and North Otago were as follows:—

Mr. Duncan Cameron of Springfield.

	Freehold Acres	Leasehold Acres
Acton (near Rakaia) ..	15,162	2,520
Levels (near Timaru) ..	60,233	11,605
Pareora (south of Timaru)	17,413	
Hakataramea	24,327	
Ardgowan (near Oamaru)	4,480	
Totara (near Oamaru) ..	10,613	

In the 80's on Acton, Pareora, Totara, and Edendale the total annual cropping programme was about 5500 acres of wheat, 4500 acres of oats, and 800 acres of barley. Crops were frequently grown in paddocks of 400 acres, and usually about 12 reapers and binders worked in the one field. The average yields at Pareora and Totara were about 60 bushels an acre and at Acton 25 bushels.

By the 90's the company had sold some of its land and Acton by this time was reduced to 8000 acres, of which 2000 acres were usually under wheat and oats and 800 under rape and turnips, etc.

As it was a commercial undertaking, the company kept detailed accounting records, and their figures on the cost of producing wheat are interesting, though, on existing costing knowledge, they leave much to be desired.

In 1889 the expenses shown to produce 34,644 bushels from 1283 acres at Pareora were as follows:—

		£ s. d.
Cost of ploughing, seed pickling, sowing, harrowing, harvesting, stacking, and thatching		1,824 16 10
Half cost of breaking of lea ..		178 10 0
Repairs to implements		140 5 5
General outlay, including cost of supervision		223 3 8
Insurance		60 19 6
Cost of threshing		381 11 8
Carting coal		1 10 5
Sundries, twine, etc.		3 16 9
Actual cost of production		£2,814 14 3
Cost of delivery and cartage	£150 15 11	
Loading into railway trucks and receiving into store	25 11 5	
Grading	1 14 7	
		178 1 11
		£2,992 16 2

The cost worked out at 1s. 8¾d. a bushel and the price received was 4s. a bushel.

The company was a pioneer in many directions. The manager of Acton in the 90's, a Mr. Allen, was a keen advocate of irrigation, and constructed water races through the property, taking the water from the Rakaia River. The following are extracts from a report on the results obtained: "From 1894 to 1896, 9000 lambs per annum were sent to market fat, realising 10s. 6d. each. It was estimated that at least one-half of these would have been sold as stores at probably 5s. per head had it not been for the extra growth of grass and clover, the result of irrigation. The clover paddocks which had been watered regularly for three years were still vigorous and yielded heavy cuttings, while those which could not be watered died out after two years. In January, 1898, 25 acres of wheat were watered; the result was a yield of 14 bushels against 7 bushels on the unwatered section."

There were other examples of large-scale cereal-producing properties, such as Menlove, of Windsor Park, Oamaru, but those quoted give some idea of properties which produced the bulk of the wheat during the two decades that it assumed such importance in New Zealand's farming history.

Family Farms

The magnitude of these bonanza farms rather overshadows the efforts of farmers who were carving out for themselves on the plains of Canterbury and Otago the smaller units which were to become of considerable importance after the 90's. Though every farmer could not operate on the

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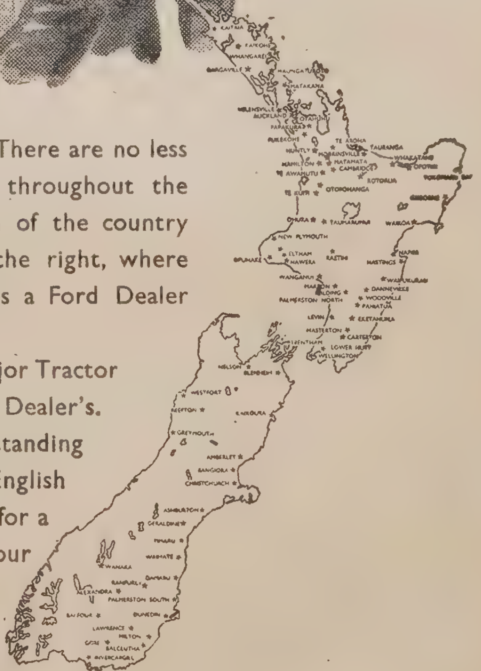
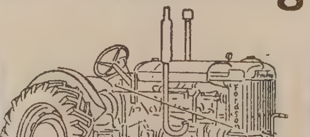


Another reason for choosing the English

FORDSON MAJOR



FORD MOTOR COMPANY OF NEW ZEALAND LIMITED LOWER HUTT 41 scale of a Grigg or a Cameron, these men on the smaller units were like their large-scale contemporaries, hardy and resourceful pioneers; their small-scale cropping activities were able to exist side by side with those of the "wheat barons."

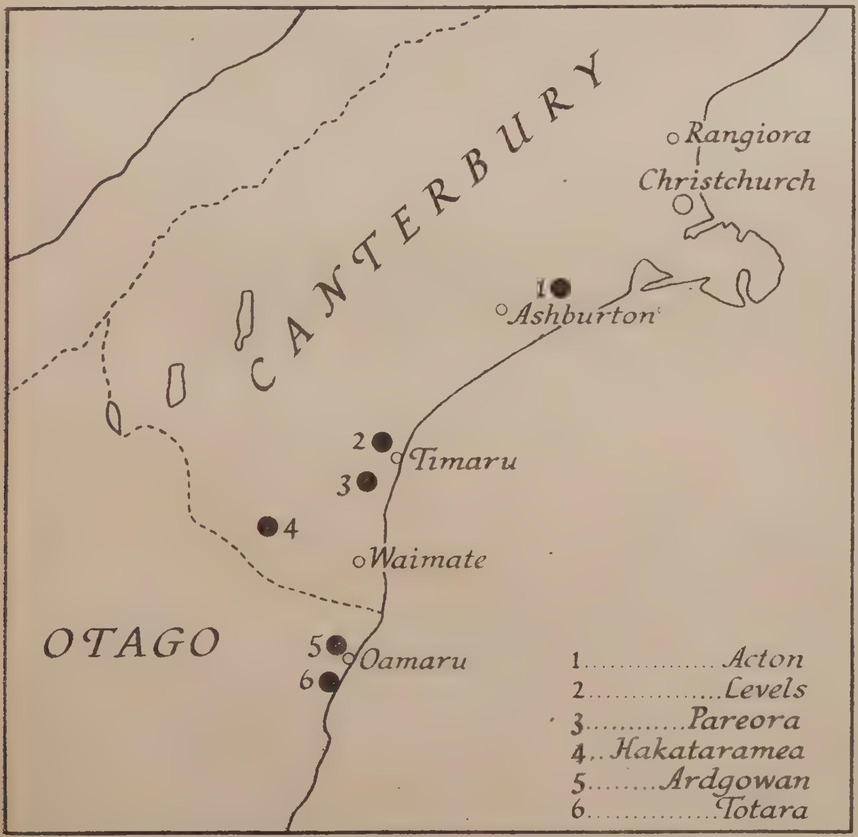
In the 60's the periphery of settlement around Christchurch and Timaru was being pushed out, and a number of men took up small areas of land around Kaiapoi, Rangiora, and Lincoln; the forbears of some of the present families in the Ellesmere County—the Brooks, Cunninghams, Coes, and Inwoods—were commencing in a small way at this time. There was a Morris at Waikuku and a Wornell at Leithfield in 1859, and a little later John Stevenson had taken up an area of the Flaxton swamp.

In South Canterbury the small-scale farmer was beginning to play his part. It was estimated that by 1867 about 36,000 bushels of wheat were grown in the Geraldine district and 15,000 bushels around Pleasant Point, and about the same period it was stated that the area sown in wheat around Temuka was so large that there was little prospect of one-tenth of it being consumed in the district.

It is interesting to see how some of these men got a start in Canterbury. Having secured his section of land, the settler usually had little capital left and would then endeavour to get someone with a plough to skim some of his land. He would probably get the same person to put in his crop, returning payment by working for the other man. For the first season, seed wheat, a spade, and a shovel comprised the complete working capital of some of these men. If the harvest turned out well, the settler might next purchase a pair of bullocks and a plough, and so step by step get all the implements necessary. At this period a complete outfit consisted of two single-furrow ploughs, a pair of wooden harrows with iron teeth, a wooden roller, a Burgess and Kay reaping machine, a hand chaffcutter, a horse-driven threshing machine, and spades, shovels, and a scythe.

These early farms were scattered and were often surrounded by open, tussock-covered plain. There are records of one such farm, which now forms part of the Lincoln College farm, the wheat crops on which in 1863 were partly surrounded by a sea of waving tussock, and it would have been possible to ride out from it across the plains to the foothills without meeting one fence.

Living conditions were primitive and were particularly hard on the pioneer women, loneliness being one of the greatest hardships. The first houses were invariably built of sod and plastered inside with a mixture of dung and clay which was whitewashed when dry. On the plains lack of water and fuel was frequently a real problem. Some women had only straw for fuel, and water was so precious that it served many purposes before it was considered to be too polluted; cases have been quoted where it was used first for the milk cans and last for the baby.



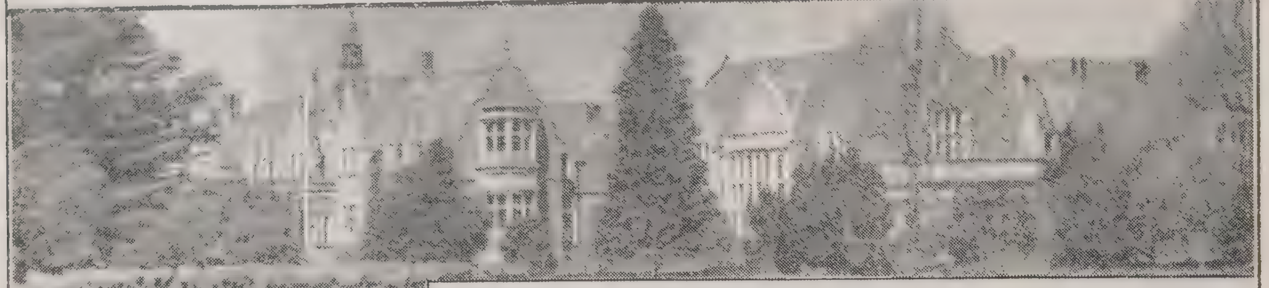
Location of New Zealand and Australian Land Company's holdings in Canterbury and Otago in the 90's.

An old Otago colonist writing to the "Country Journal" in 1889 described the method by which some Otago settlers started their farming ventures: "The resources of the settlers were frequently exhausted by the purchase of their land, probably a 50-acre section at £2 per acre. The purchaser would start on foot to his selection with a swag of tools on his back, to which, on passing the last older settler, would be added the additional burden of a kit of seed potatoes and some rations. With these he would camp down on his lowly home and would work hard for long hours on very scanty fare and in very poor quarters to hurry in a patch of potatoes and to make a pig-proof fence around it. He would then go back to the more settled districts, where he would seek employment until his little crop of potatoes was grown, when he would return with a heavier load of rations; this time he would put in a larger crop and build a whare so that the next season he might have the joy of conveying his family to the scene of his future expectations. The first year was one of struggling and contriving; the second an industrious family would grow wheat which made their bread, they would grow enough potatoes and other vegetables for home use, and would raise poultry and perhaps get a cow; the bush would furnish pigeons and the river eels, which, with an occasional pig, would help out the table. The third year they generally contrived to get up a better house, still of bush stuff, for in those times there was no sawn timber."

Wheat Exports and Imports

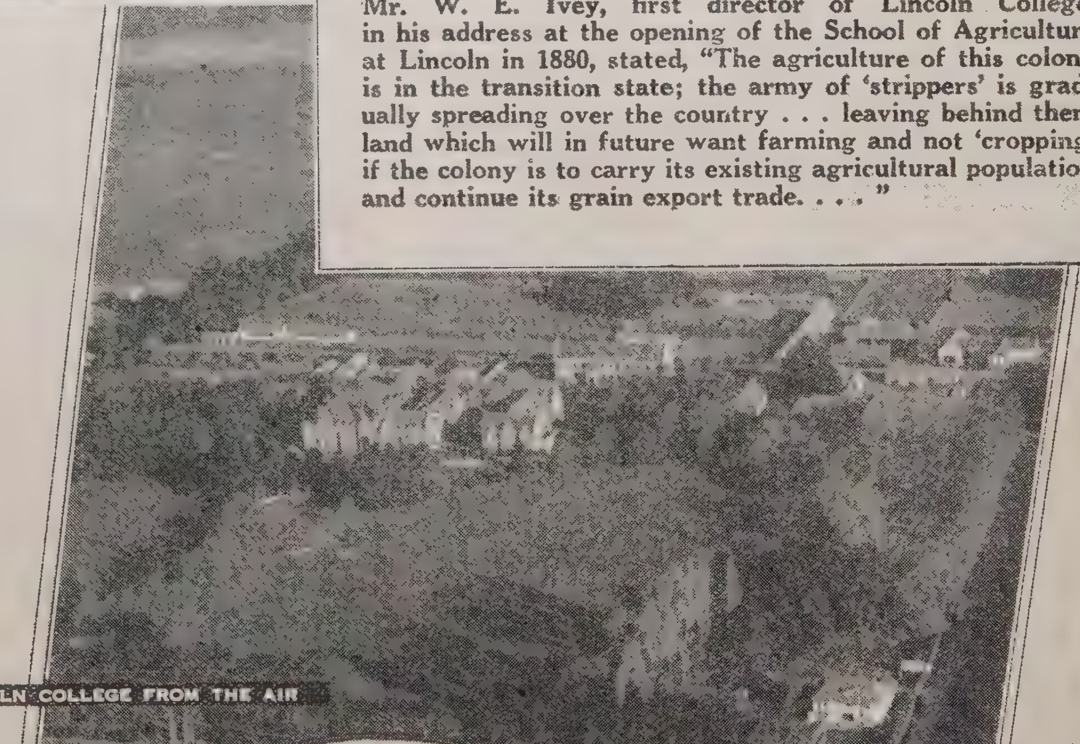
There was a fairly considerable export of grain in the 1850's, but this ceased during the gold rushes in the 60's, when it was necessary to import considerable quantities to help feed the increased population. In 1866 nearly 1,400,000 bushels were brought in. Exports revived again in 1867 and increased steadily until 1883, when approximately 4,000,000 bushels were sent

SOIL MANAGEMENT PRACTICES



LINCOLN COLLEGE IN 1947

Mr. W. E. Ivey, first director of Lincoln College, in his address at the opening of the School of Agriculture at Lincoln in 1880, stated, "The agriculture of this colony is in the transition state; the army of 'strippers' is gradually spreading over the country . . . leaving behind them land which will in future want farming and not 'cropping' if the colony is to carry its existing agricultural population and continue its grain export trade. . . . "



LINCOLN COLLEGE FROM THE AIR

LINCOLN COLLEGE IN 1880

out. This was the period of the large-scale wheat farms.

With the advent of refrigeration in 1882 and the resulting increased production of frozen lamb and dairy products, grain exports declined, except for some temporary revivals like that during the Boer War, when quantities were exported to South Africa. By 1913, when insufficient wheat was grown to meet the needs of the increasing population, importation again began and has continued until the present day. The accompanying graph of net imports and exports of wheat shows clearly the history of the industry in New Zealand.

Fertilisers

Although the dangers of continuous cropping were early recognised, it was not until the development of the frozen meat trade that rotation of cereals, fodder crops, and pastures became really profitable.

Mr. W. E. Ivey at the opening of the School of Agriculture (later the Canterbury Agricultural College) at Lincoln in 1880 said, "The agriculture of this colony is in a transition state; the army of 'strippers' is gradually spreading over the country further and further from the centres of population and shipping ports, leaving behind them lands which will in the future want farming and not 'cropping' if the colony is to carry its existing agricultural population and continue its grain export trade. So long as land will on mere ploughing and sowing grow grain in paying quantities, any man with an amount of money to pay his way for a few months can 'strip' the grain which a virgin soil and a fine climate combine to produce for him. He need not have more than the crudest, if any, idea as to why crops grow or how they feed. But the man who succeeds the 'stripper' in the occupation of the land must be a man of knowledge, of observation, and of experience. It is men of this class that form the backbone of a successful agricultural community, and it is to the problems of the producing men of this class that our endeavours should be directed. . . ."

Ivey immediately interested himself in developing the use of fertilisers. Previously farmers had used small quantities of local bonedust and some imported rock phosphate and Peruvian guano. Ivey introduced superphosphate to Canterbury in 1881, importing his own supplies of Lawe's and Odam's superphosphate at a cost of £9 10s. a ton.

He laid out numerous trials to show the advantage of using it, and from the experience gained he was able to prophesy a big future for superphosphate. Probably he would have been amazed if he could have foreseen that in 1940-41 the country was to use 600,000 tons of superphosphate, and that even this supply was inadequate to meet the demand.

Another keen advocate of the use of fertilisers was George Gray, who was first demonstrator in chemistry at Canterbury College and later chemist at the School of Agriculture, Lincoln. He lost no opportunity of impressing farmers with the need for maintaining the fertility of their soils through a rational rotation of crops and the use of fertilisers and lime.

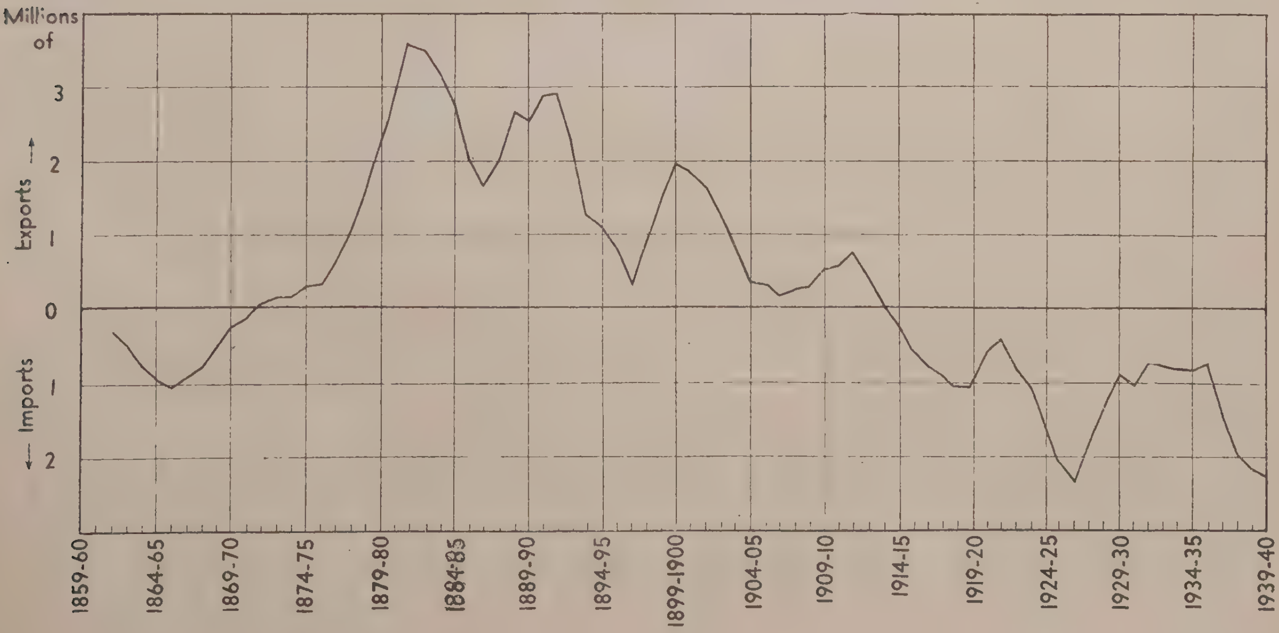
The "Country Journal" was always to the fore in endeavouring to further the use of fertilisers, and when a chemical manure works was started at Belfast in 1882 this journal made the following comment: "The chemical manure works started at Belfast are of considerable interest from the agricultural point of view. Our future progress in agriculture depends on the facilities afforded for obtaining manure with which to restore to our soils the elements of plant foods which are now being removed from them by cropping, and it is gratifying to know that we have already in our midst the means by which the restoration can be effected, since it will tend to hold in check the exhaustion to which our soils are liable if we continue to follow in the steps of other new countries such as America and Australia."

In 1896 Bayne, Director of the Canterbury Agricultural College, advised sowing ¼cwt. of superphosphate with wheat and topdressing with ½cwt. of nitrate of soda when the crop was 6in. high, and his successor, Lowrie, in 1903 introduced as a regular practice the sowing of superphosphate with wheat. To these men must go a part of the credit for the pioneer work in the use of fertilisers.

Milling

Man grows wheat to produce flour, and the picture is thus incomplete without some reference to the development of milling in the wheat-growing areas of New Zealand.

NET EXPORTS OR IMPORTS OF WHEAT (INCLUDING FLOUR): FIVE-YEAR MOVING AVERAGE



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The first settlers had small hand grinding mills, but this household task soon passed to commercial enterprise. Hay recorded that in the 40's William Webb erected at Okains Bay, Banks Peninsula, a small windmill for grinding wheat. The mill was a steel hand mill, the grinding being done by two steel cones almost fitting into each other, and with a good wind three bags a day could be ground.

The first commercial mill in Canterbury was opened in 1853 by Mr. D. Inwood, who charged 1s. a bushel for grinding. By the 60's there were a number of mills in both islands; there were four on the Wanganui River, and, at practically the same time, seven on the Avon in Christchurch. By the 90's they were scattered throughout the wheat-growing area in Canterbury, and in the Ellesmere County alone there were four within a radius of six miles of the county centre of Leeston.

Most of these mills were situated on streams, water being the motive power, but a few were driven by wind; one of this type operated in the 50's in Antigua Street, Christchurch, then known as Windmill Road, but it was later bought by a Mr. Leith and shifted to Leithfield, North Canterbury, where it operated until wrecked by a nor'-west gale in 1885; this mill worked two pairs of French millstones 4ft. in diameter. Some of the parts were subsequently used in a mill at Amberley.

With improved means of transport, milling gradually became centralised in the cities and boroughs. In 1893 there were 22 mills operating in the country districts of Canterbury; today there are only four.

In the early mills the grain was ground between two stones which were usually about 3 to 4ft. in diameter and about 1ft. thick. Grooves were cut in the working faces so that when wheat was fed through a hole in the middle and the upper stone was revolved the flour and bran trickled out at the circumference.

The fate of some of these stones is both interesting and varied. Some have found a resting place with the Wheat Research Institute in Christchurch, one reposes as a doorstep to a country church near the same city, and another forms part of the paving of a pig sty housing pedigree pigs.

About 50 years ago the stones gave way to the roller process of flour-milling in which the grain is broken down by two steel rollers revolving in opposite directions.

The miller is looked upon traditionally as a dusty and jolly fellow; sometimes, however, he is of a serious turn of mind and fond of the arts, as is demonstrated by the country miller in Canterbury who devoted his spare time to making and erecting in part of his mill a pipe organ. Perhaps some day, above the noise of the machinery of this mill, there may be heard coming forth the resonant notes of the organ!

Decline of Large-scale Wheat Farms

The first shipment of frozen mutton from New Zealand in 1882 showed the economic opportunities offering on the land and opened up a new era for farming. Many now turned their attention to the land and there arose a genuine land hunger.

By 1890 the best land in New Zealand had become freehold and much of it was locked up in large holdings. This, of course, did not mean that these large land-holders were unprogressive, for it was they who had advanced the techniques of farming. They had been responsible for the introduction of refrigeration and had made advances in cereal production. Their financial resources enabled them to carry the risks of experiment in the use of new machinery and in refrigeration. For instance, John Grigg in 1883 took the responsibility of shipping a load of frozen meat to England, and through a breakdown in the refrigerating equipment at sea lost several thousands of pounds. This, however, did not deter him.

It was partly because of their work in advancing farming techniques that their holdings had to give way to the smaller arable farms. After refrigeration had stimulated a demand for land by the man with little capital some political action became necessary to help break up the large estates. The Liberal Government of the 90's set about the task, first by introducing the graduated land tax in 1891, and it was under the provisions of this Act that the Cheviot Estate was acquired. The energetic Minister of Lands, John McKenzie, who brought to his task a burning conviction from his childhood in the Scottish Highlands of the right of a farming peasantry to have access to the land, introduced the repurchasing policy in 1892, and in a Land for Settlement Act of 1894 incorporated a clause under which estates could be compulsorily purchased. The machinery to acquire property by the State was now complete, but the compulsory purchasing provision was very sparingly used, and in fact was not necessary, as it appeared that many large land owners realised that a change had to eventuate, for the Government always had more estates offered to it than it could handle.

The Government policy was definitely not one of land nationalisation, for it was the Liberals who introduced the Advances to Settlers Act, which was designed to enable men with small capital resources to acquire freehold properties.

From this time there gradually came into being the smaller mixed farming units as we know them today. Some idea of this change can be gauged from the activities of the Government in purchasing land and subdividing it for settlement. In 1893 the total number of Crown leases in Canterbury was 1020; by 1900 it had reached 2300, and by 1910 there were 3290. Several large properties, such as Cheviot in North Canterbury and Rosewill and Waikakahi in South Canterbury, had been acquired by this time, the two last-named being subdivided into 336 holdings.

In the 70's the farmer's revenue came mainly from wool, but on most parts of the plains of Canterbury and Otago it now comes from many sources—cereals, small seeds, fat lambs, and possibly a few cows, which bring a little sideline revenue to the farmer's wife. The farmer is a man of many parts; he must know how to produce his cereal crops, grow small seeds, and produce supplementary fodder crops for winter feed for his sheep; he must know something of animal husbandry, and is often a mechanic when his implements develop faults, besides being a reluctant bookkeeper and form-filler to satisfy the demands of the Commissioner of Taxes and other Government Departments.

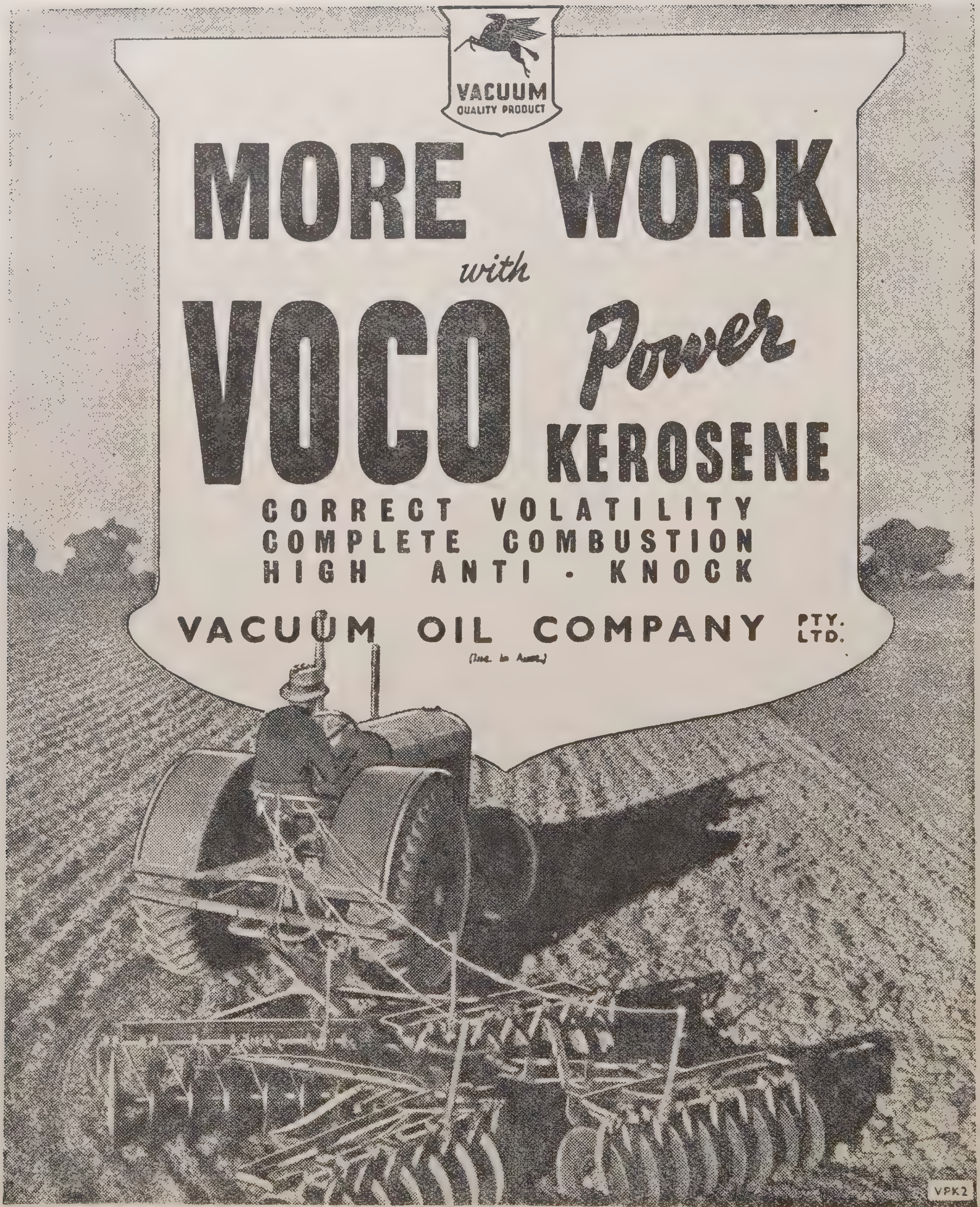
Acknowledgments

Acknowledgments and thanks are expressed to a number of farmers in Canterbury who gave freely of their time to answer questions; to the secretary of the Canterbury A. and P. Association, and to Messrs. P. and D. Duncan of Christchurch and Reid and Gray of Dunedin, who made available some of their records.

Photographs on page 364, the horse team on page 356, and the lower photograph on page 360 are by Green and Hahn Ltd. Those on page 358 are by Rex Studios, Ashburton.

References

"New Zealand in the Making," Condliffe; "Jubilee History of South Canterbury," Anderson; "Wheat in New Zealand," Hilgendorf; "Fertilisers in New Zealand" (unpublished thesis), McCaskill; "Rural Economics of Australia and New Zealand," Wallace; "Te Waimate," Studholme; "History of North Otago," MacDonald; New Zealand Encyclopaedia; "Agricultural Organisation in New Zealand," Belshaw, Williams, and Stephens; "Earliest Canterbury and Its Settlers," Hay; "The Wheat Grower;" "New Zealand Country Journal" (publication of the Canterbury A. and P. Association, 1876-1898); Canterbury A. and P. Association Reports; "Christchurch Press;" "Lyttelton Times;" Year Books and New Zealand Statistics, and Canterbury Agricultural College Magazine.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Blue Lupins

By R. INCH, *Fields Instructor, Ashburton.*

FOLLOWING their introduction to Canterbury about 20 years ago the use of blue lupins *(Lupinus angustifolius)* has steadily increased. Over the past 10 years, with the stimulus given by the development of a "sweet" variety for lamb fattening, they have now become a crop of considerable economic importance in Canterbury, and their use is gradually spreading to other parts of New Zealand. They have a high nutritive quality, and are an excellent crop for raising the fertility of the soil. This, combined with their comparative freedom from disease and the fact that they remain untouched by insects that attack crops of rape and turnips in dry seasons, gives them a well-deserved popularity.

[*Barwell Studios.*

A typical plant of blue lupin.

THERE are several varieties of lupins, both annual and perennial, and all grow well on poor or light sandy soils. They will also tolerate acid soils, except where drainage is inadequate and water is retained near the surface. Perennial yellow lupins are well known for their binding value in sandy wastes along the seashore, in riverbeds and other similar places, and for building up fertility in these areas preparatory to sowing pasture seeds or before afforestation.

Of the three annual varieties, white, yellow, and blue, the blue is best known and most popular. It has given uniformly high results as a sheep feed, and provides a large bulk of green manure for ploughing in where required. So well known is it, in fact, that when the average farmer speaks of "lupins" it is accepted as a matter of course that he is talking of the **blue** variety. A plant with a low alkaloid content has been selected from the ordinary blue variety, and is now commonly known as **"sweet** blue," the original blue being called "bitter" to distinguish it. In the following notes the name "lupins" is used generally for "bitter" blue, but may be taken to include the sweet blue where applicable. If it is necessary to differentiate between the two varieties, they are named "sweet" and "bitter." White and yellow lupins have not yet become of economic importance.

Lupins have been used in Europe for many years for building up poorer soils; thence their use spread to England and then to Australia and New Zealand.

In the early days in New Zealand they were used chiefly to green manure orchards and gardens. As a quick-growing legume they proved ideal. Some farmers attempted to grow them for sheep feed, but as their habits were not understood, results were not altogether satisfactory. Lupins are extremely bitter, and stock do not graze them readily at first. The plant also contains an alkaloid which is liable in some cases to cause "staggers" or death, particularly in breeding ewes. It was also claimed that the seed was difficult to harvest. These factors retarded their use as a valuable fodder crop.

Utilisation

Twenty years ago the feeding of lupins to sheep in this country was in the experimental stage. Ten years ago their use was confined to a few farmers in scattered localities. Today in some Canterbury districts they are as common as crops of turnips or rape, and the farmer on the light or medium soils of Mid-Canterbury who has not grown at least one field of lupins is rare indeed.

As the successful growing of turnips on the lighter soils of Canterbury has become uncertain because of dry weather and insect pests, the crop has, in certain localities, been replaced by lupins for autumn and winter feed. The bitter blues are not fed as a fattening crop, but more as feed that will maintain the flock in healthy condition, and give that succulent green bite when other green feed is short. It cannot be said that a heavy crop of lupins is better than a good crop of turnips, but in average years they have been found more reliable, and consequently they have replaced turnips to a considerable extent in districts where turnips fail to yield consistently.

Although they were originally most popular on light or medium land, the use of lupins has spread to the heavier soils, and they are now grown from the seashores to the foothills. They are sown alone or in varying mixtures with other crops such as turnips, oats, or Italian and perennial ryegrass.

Sweet Blue Variety

Sweet blue lupins were introduced to farmers a few years ago with varying success. Their chief advantage is their lack of bitterness due to their low alkaloid content. Unlike the bitter variety, to which sheep have to become accustomed, lambs take to sweet blue lupins quite readily and fatten on them as well as on rape. Generally they are more delicate than the bitter type, and some farmers who have been successful growers of the latter have been disappointed in the results obtained from the sweet, but farmers who have persevered with them have found them quite satisfactory.

There appears to be a definite place in farm economy for the sweet as well as the bitter blue, but only by experiment can this position be defined. It was noticeable in the first year of their distribution that where farmers had only small areas of one or two acres hares and rabbits were very partial to the plants in their early stages of growth, and apparently came long distances to sample them.

Alkaloid Content

E. B. White states that the alkaloid content of lupins, that is, the bitter substance in the plant, increases from 0.25 per cent. to 0.4 per cent. during flowering, and then falls to about 0.2 per cent. as the seed ripens. The greatest concentration of alkaloid is in the cortex of the side stems. By comparison sweet blue lupins contain about 0.01 per cent. of alkaloid.

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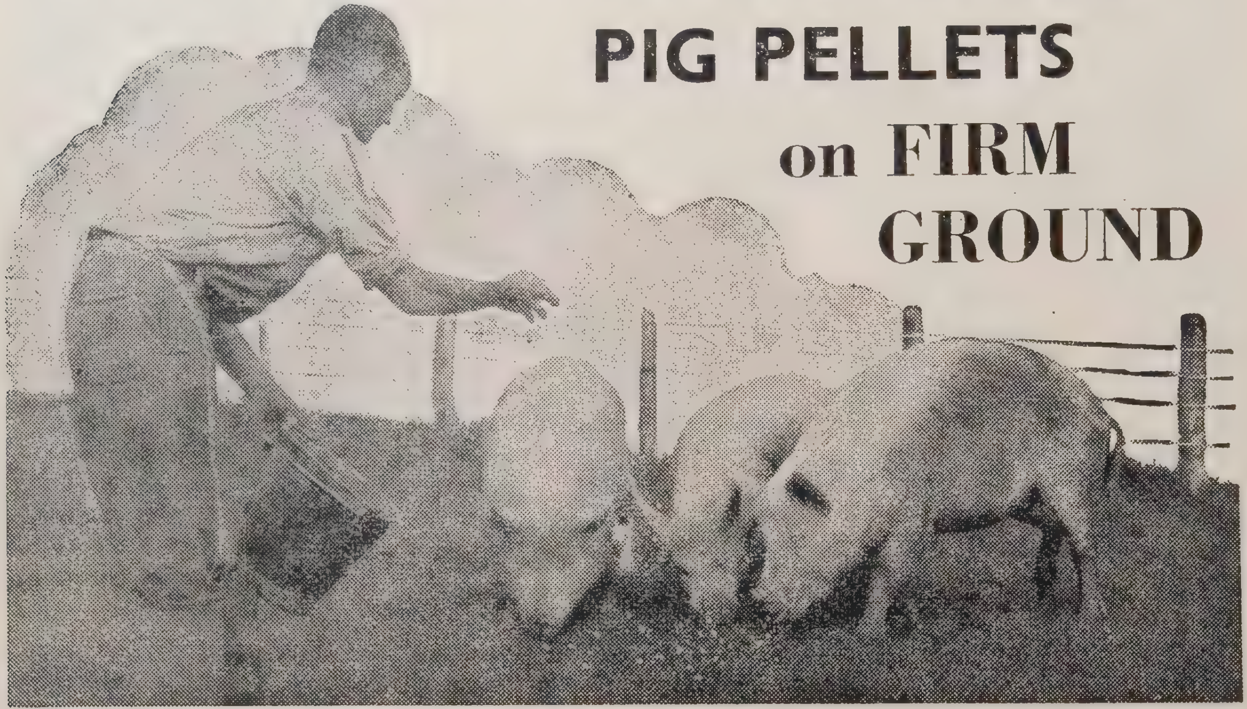

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Although cases of poisoning from lupins have been recorded, the bulk of lupins seem to be sufficiently low in toxic material to be considered safe under good farm management. Lupins are fed at all stages of growth, but appear to give the maximum amount of feed immediately before flowering.

Sheep do not take readily to this bitter feed at first, but if it is introduced gradually, they become accustomed to the flavour, and afterward, even months later, they will eat it without hesitation often in preference to other foodstuffs. Lambs are more difficult to manage, and if forced to eat lupins because no other feed is available, will invariably suffer a severe check.

By sowing small amounts of bitter lupin seed (about ½ to 1 bushel) with rape, turnips, or Italian or perennial ryegrass, an alternative is given, and it will be found that lambs will in time graze the lupins as well. It must be repeated, however, that the bitter lupins should be treated as a good change of feed rather than as a fattening crop. For fattening a trial should be made with the sweet variety.

To graze lupins the paddock should be fenced in breaks, as when feeding turnips, and when the sheep are first put on the crop it is advisable to leave them for short periods only. As when grazing other succulent feeds, it is preferable not to have the stock too hungry at the start. As they become accustomed to the crop the grazing period can be gradually extended.

Lupin seed may be fed to sheep in small quantities of up to ¼lb. a head daily, provided that bulky feed such as chaff or hay is fed as well. Here again care should be taken to prevent one or two sheep from bolting more than their share.

[*Barwell Studios.*

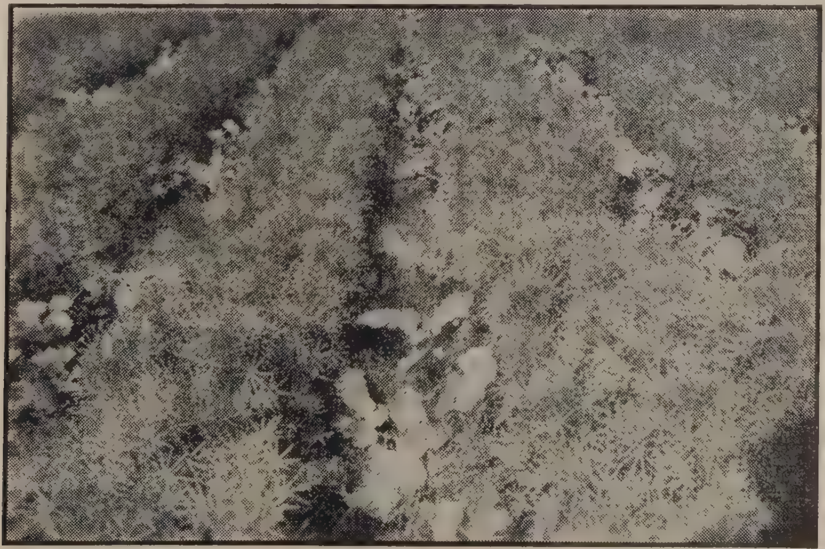
Blue lupins are a well-balanced sheep feed.

Resistance to Frost

Lupins are resistant to heavy frosts until they reach the flowering stage, when they are more susceptible. Where winter feeding has not been completed before the flowers appear, it is advisable to mow what is left of the crop and let it lie, as it will not be affected by frost, and will provide good feed for another one or two weeks.

Soil Improvement

Lupins are excellent for improving the soil. Like other legumes they have power to collect nitrogen from the air. With strong tap-roots penetrating deeply into the soil, they also grow a large amount of green fodder, which, if ploughed in, makes excellent manure. Although there may be different opinions on the merits of grazing versus ploughing in, it is agreed that fertility is higher after lupins than if they had not been grown. In poor, sandy soils lupins ploughed in as green manure rot fairly quickly and are one of the best crops for raising the humus content of the soil. When the crop is fed off, the roots with the nitrogen nodules are left in the ground and a good proportion of the green material is returned by the voidings of stock. Although the amount of humus returned may not be as high when the crop is fed off, this may be offset by the monetary return in the grazing. Both methods are sound, but the farmer has to make the decision to suit his own conditions.



[*Barwell Studios.*

Blue lupins sown with ridged swedes.

Lupins and Disease

Lupins have been particularly free from serious attacks by insect or fungoid pests up to the present. A virus disease called "sore shin" has been known to affect fairly large areas. It has been investigated by Neill, Brien, and Chamberlain, and has been identified as pea mosaic, the disease causing the mottled, stunted appearance in peas and clover. This mosaic will overwinter in red clover and later attack the lupins.

The symptoms of "sore shin" are described as follows in the New Zealand "Journal of Agriculture" of September, 1934, by the investigators mentioned above: "The first visible symptoms of the disease are a slight stunting of the plant associated with the

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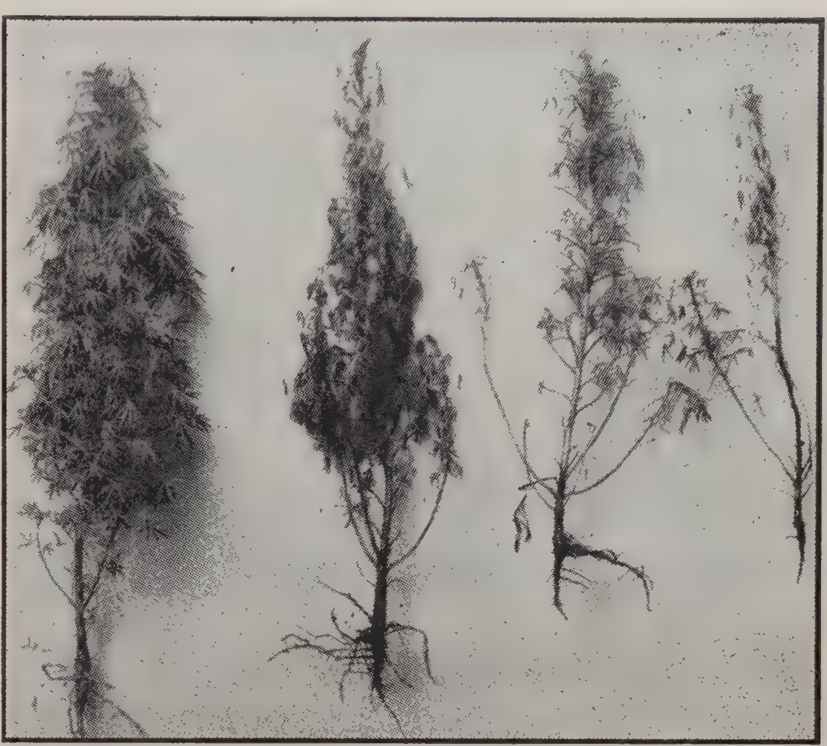


Sore shin attacks the plants at all stages of growth. A healthy plant is shown on the left and the other plants show the disease at various stages.

characteristic curling of the growing point to one side. Simultaneously a light brown streak appears on that side, extending the whole length of the stem. Growth ceases with the first symptoms of the disease. When the vascular system of infected plants is cut a brown discoloration appears, which is more extensive in the roots and growing points than on the main stem. The discoloured area subsequently extends until the whole stem becomes brown. The young leaves at first wilt, and then turn black, while the older ones become tinged with purple, turn yellow, and ultimately fall. The stem turns black, the roots decay, and the plant dies. Infection takes place at all stages of growth, being observed in seedlings and in tall and mature seeding plants."

It is usual for odd affected plants to be found throughout crops, but except for these, no damage is done, though occasionally the disease becomes more widespread.

Crops sown too late to become established before wet, cold weather sets in are subject to attack by weakly parasitic soil fungi, but serious damage is rare.

Sowing for Autumn Feed

Lupins intended for autumn feed should be sown on a well-prepared bed, preferably after a fallow. The soil should be firm and contain enough moisture to carry the crop through any dry period. Drilling may take place from mid-December to mid-February, depending on the district and season, at 2½ to 3 bushels an acre. Sowings at this time should give the maximum amount of feeding for April, May, and June. Where lupins have not been grown in a district before and where their growth habits are unknown, it is advisable to sow small breaks at fortnightly intervals, so that the correct time for that locality may be known. Seasonal variations must also be taken into account. Only by experimenting can the right time for sowing be discovered. Lupins sown correctly give a large bulk of feed for the autumn and winter.

Where the ground is in good heart fertiliser is not necessary, but up to 1cwt. of superphosphate can be used to advantage in poorer soils. Where the germination of the seed is not known it is advisable to test it before sowing in order to adjust the rate of seeding if necessary.

Lupins usually leave the soil in a very friable condition, and in excellent order for a spring-sown cereal or other crop.

For Spring Feed

Lupins for spring feed can be sown after a cereal crop in March or April, at 1 to 2 bushels an acre, with ½ to ¾ bushel of ryegrass or oats. It is also advisable to ensure that the ground is firm before drilling. As frosts check the growth and may damage very young plants, it is advisable to sow early enough for the plants to reach a reasonable height before frosts occur. This crop should be ready to feed the following September. Care is needed with this feeding, as it is sometimes found that an excess of lupins in the spring, with fresh growth after a more or less dormant winter, has a toxic effect on ewes. Where a run-off to a good grass paddock or supplementary feed is provided lupins are a valuable feed.

Where lupins have not been eaten back too hard after spring growth has started a second growth will come away from the plants after stock has been removed. If the crop is not required for sheep feed, it can be left for seed.

Seed Crop Sowing

Although lupins can be harvested over a long period, it is advisable to plan for a crop to be harvested in December, for at this time the weather for ripening the seed is usually ideal and harvesting machinery is not so likely to be wanted for other crops. Moreover, seed harvested then is available for further sowings or for sale while the demand is keen.

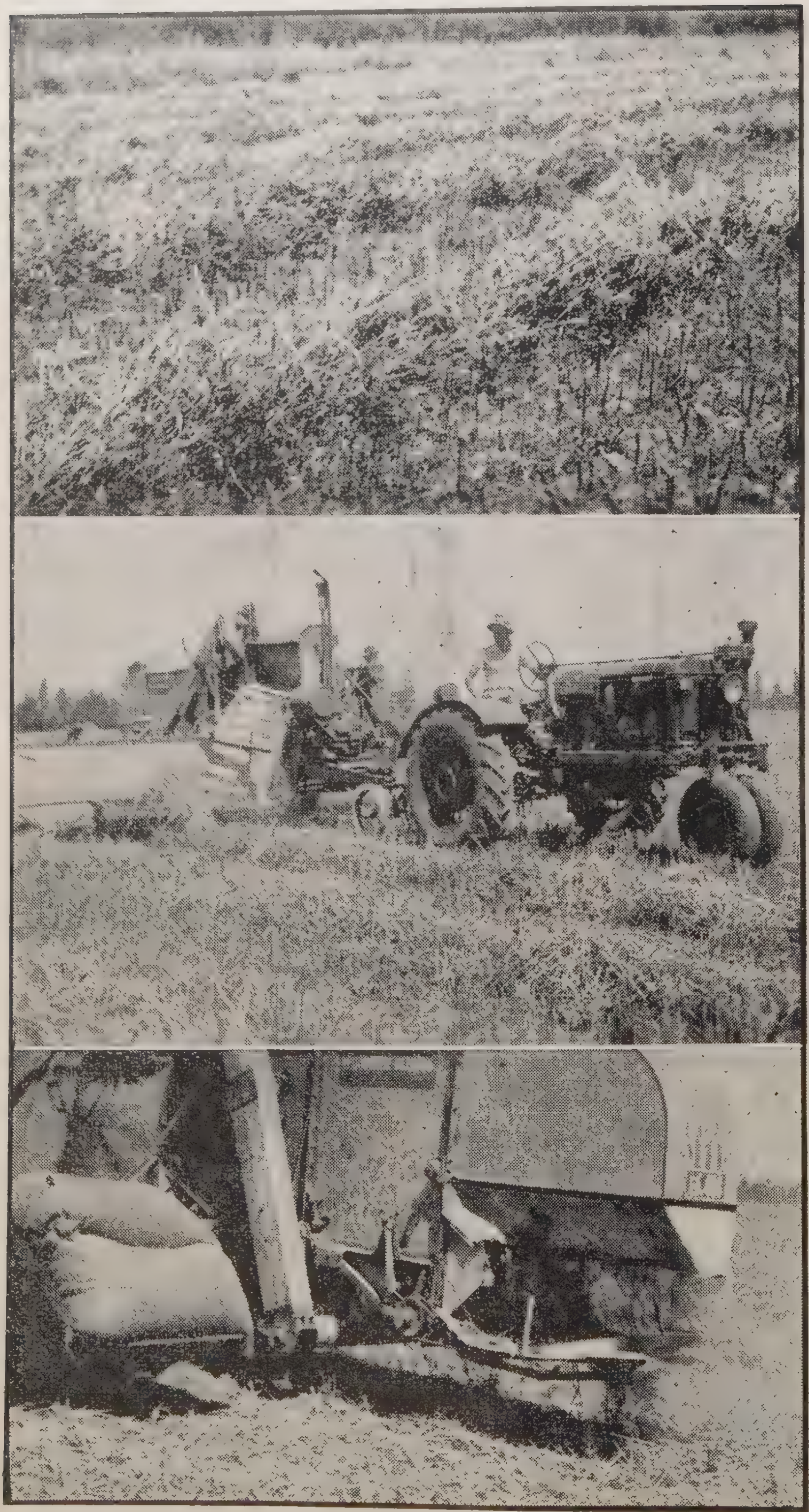
Where a seed crop is the primary objective seed should be sown during March at 2 to 3 bushels an acre. Spring-sown crops may ripen late and generally come in when the farmer is busy with other work. Also weather conditions for harvesting in the late summer or early autumn are not generally as favourable as they are earlier in the season. Nevertheless, a great many lupin crops for seed are sown in the spring, particularly in September and early October.

Harvesting for Seed

As with other crops, reaping with a binder, then stooking, and, if necessary, stacking will probably give the highest yield, and perhaps a better sample of seed, but this method is expensive, and involves considerable labour. Lupin pods are hard and sharp at the tip, and cause heavy wearing of binder canvases. More popular these days is the use of the header harvester, either for heading direct or to pick up the crop from windrows.

Even under most favourable conditions it is scarcely possible to save all the seed from a crop, as when the seed pods are fully matured shattering takes place readily during hot weather. On the other hand, if the seed is harvested too green, germination may suffer. In dry nor'-west weather there is often

HARVESTING LUPINS FOR SEED



[*Barwell Studios.*

Upper—A windrowed crop ready for the header. Middle—Heading lupins from the windrow. Lower—This spreading attachment at the rear of the header spreads the heavy stalks and thus simplifies the ploughing of the field.

only a short time between the two stages, and a careful watch has to be kept on the crop if losses are to be kept to a minimum.

It is advisable to thresh in the very early morning or evening, for the seed pods are then not as brittle as during the heat of the day. Where the crop has ripened evenly it may be direct headed successfully, but if the pods are at different stages of maturity, it is wise to windrow, and then pick up and thresh later.

If seed is out of condition when threshing, it should be put in partly-filled sacks and hung on a fence until completely dry. A crop harvested out of condition and stored in bulk may lose its power of germination in a very short time. Lupins thresh easily, and care is essential in setting the drum so that the seed is not cracked or broken. Cracked seed may germinate but, as a rule, the plant will fail to develop.

After harvesting there will usually be a fair quantity of seed left on the ground. If the paddock is then grubbed lightly, once or twice, with a stiff-tined grubber, or disced to cover the seed, a second crop may be obtained with a minimum of cost.

Summary

Blue lupins are a valuable fodder crop, especially on light and medium soils. They are generally a safe crop under average farm management and provide a considerable amount of feed. Extra care should be taken when they are used for spring grazing.

They are excellent for introducing nitrogen into the soil and are valuable as green manure.

Where they can be successfully grown sweet blues have distinct possibilities for lamb fattening, either alone or with rape. Sheep should be introduced to bitter blue lupins gradually, until they have acquired the taste, when they will eat them readily.

Lupins can either be sown alone or in mixtures with rape, turnips, or ryegrass. Except when very young, or in the flowering stage, they will withstand frost. In general, lupins are troubled little by disease or insect pests.

They will provide grazing over the greatest part of the year, if required. They should not be sown too deeply, and germination of seed should be tested before sowing. Seed shed in harvesting will grow if covered by a light grubbing.

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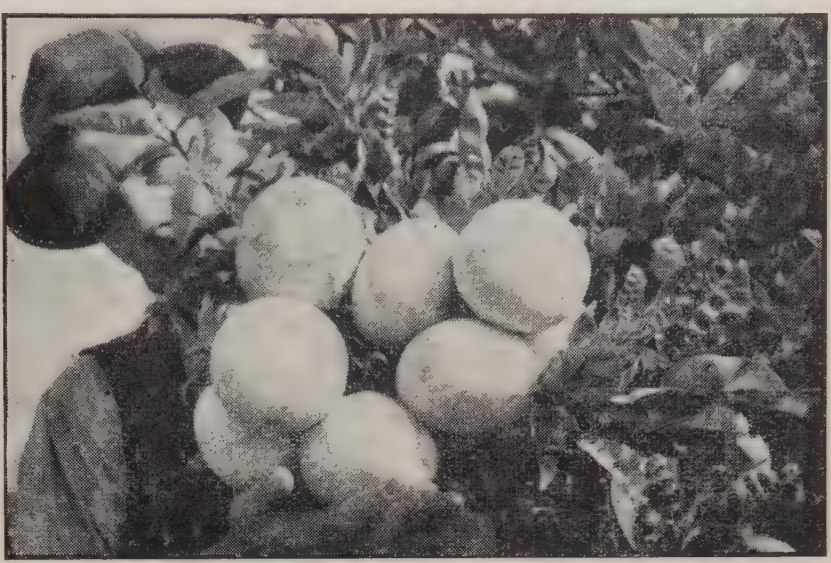
Wheeny Grapefruit Promises to Lengthen Season

By I. L. NOTTAGE, *Orchard Instructor, Auckland.*

THE New Zealand grapefruit has been instrumental in making New Zealanders appreciate this fruit — so much so that they want it for a much longer period than its normal season. That position was anticipated some years ago, but unfortunately none of the well-known varieties of grapefruit grown successfully in other countries had been found capable of producing good-quality fruit under New Zealand conditions.



[Sparrow Industrial Pictures Ltd.

The Wheeny grapefruit, unlike the New Zealand grapefruit, has the true grapefruit habit of bearing its fruit in clusters, sometimes of a dozen or more large fruit.

WITH the New Zealand grapefruit established to meet requirements in its season, prospects of additional supplies to lengthen the season appeared to be limited to importations from other lands. Now, however, there are promising signs that the season may be lengthened by fully two months, and that by a variety which is of excellent dessert quality.

Brought from Australia

About 12 years ago a few trees of an Australian grapefruit called Wheeny were brought into New Zealand, perhaps without any very bright hopes in view of failures with other imported kinds. Comparatively little accurate information about the origin and history of the Wheeny grapefruit is available in New Zealand, except that the original tree is said to have been a seedling which grew in the Wheeny Creek district of Australia 70 or 80 years ago. Some suggest that it may be a seedling from a known grapefruit crossed with a lemon or sweet orange; others consider it more likely to be a chance variation of pure grapefruit parentage.

From the grower's point of view such discussions are interesting but of much less importance than the fact that the Wheeny bids fair to become a popular grapefruit with the public. It is of good quality and matures from mid-October to the end of December in New Zealand citrus districts.

Several years passed before the original trees carried fruit in any quantity, but that fruit looked and tasted well. In the following few years moderate numbers of trees were produced from the originals, mainly on *Poncirus trifoliata* stocks, which were expected to bring them into bearing early and to provide further quick tests of the quality of the fruit. There are now some hundreds of trees about 6 years old, on *trifoliata* stocks, with a much smaller number on sour orange. Very few trees of that age group were budded on sweet orange or citronelle, though a few older trees are known to be on citronelle and some younger ones are on sweet orange stocks.

Now Bearing Good Crops

Several blocks each of a few score trees on *trifoliata* stocks and about 6 years old have been bearing good crops for several years, ranging from one to two bushels a tree in the 1946 season. The trees are well formed, sturdy, usually from 5 to 7ft. high, and, unlike the New Zealand grapefruit, have the true grapefruit habit of carrying their fruit in clusters, sometimes of a dozen or more fruit each. Trees of about the same age but on sour orange stocks have grown much more strongly, began bearing several years later than those on *trifoliata* stocks, and tend to mature their fruit later in the season. Older trees on citronelle stocks have grown larger and have produced good crops of excellent fruit. It is reasonable to expect that sweet orange stocks will also make larger trees, which should produce good fruit, though *trifoliata* stocks are always likely to produce earlier-bearing trees and, at least while they are young, fruit of slightly better quality. Such has been the case with almost all kinds of citrus on *trifoliata* stock.

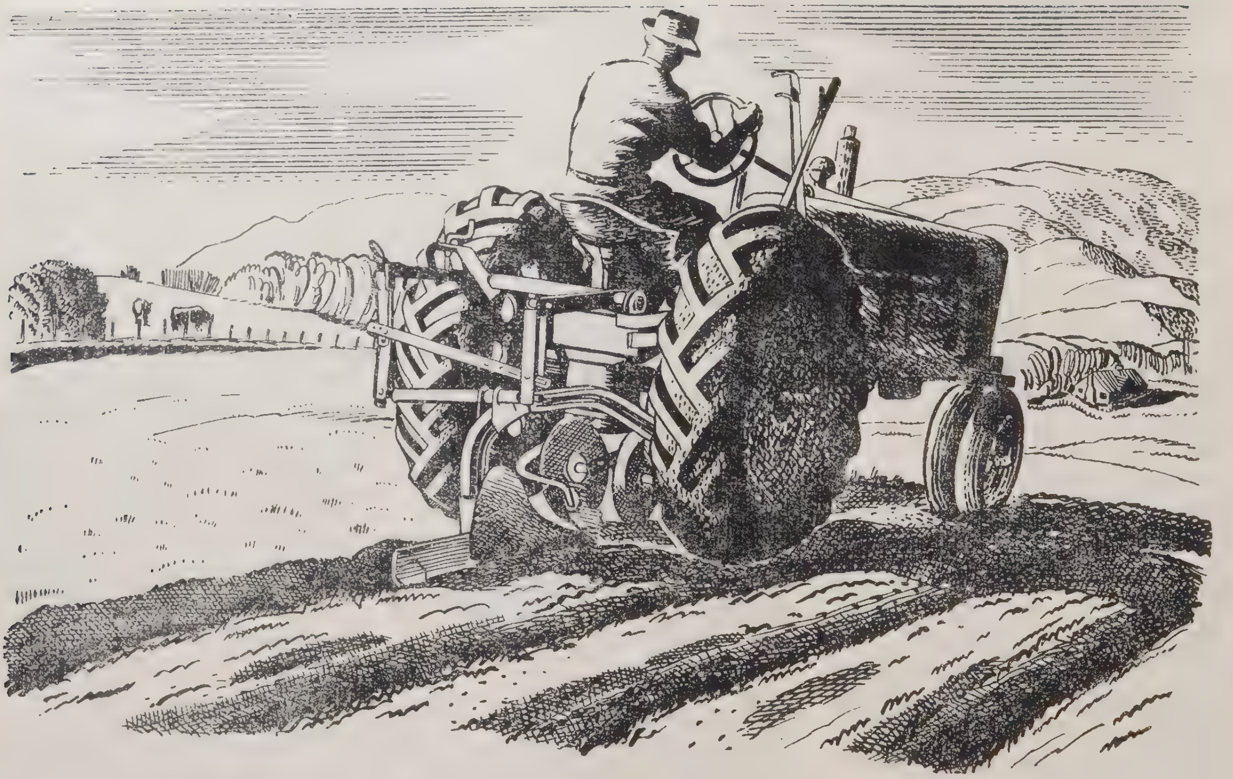
Many of the leaves on Wheeny trees have a characteristic wrinkled appearance, somewhat resembling a condition not infrequently found on New Zealand grapefruit trees exposed to persistent cold winds — indeed, the wrinkling appears to be accentuated on Wheeny trees in such positions.

The fruit is large, usually carried in clusters, which may need thinning, and similar in shape, colour, and general appearance to the Marsh's Seedless grapefruit. The rind is thin and perhaps more easily injured than that of the New Zealand grapefruit, a characteristic which may necessitate wrapping, especially for long journeys. The flesh is of fine texture, full of juice, with extremely little rag. Seeds are very numerous but are small and usually not well developed. They are grouped fairly compactly near the centre of the fruit. The flavour is distinctive, a pleasant grapefruit of bitter-sweet blend. Immature fruit has a most unattractive flavour.

Opportune Season

The Wheeny season is most opportune. New Zealand grapefruit taper off about the end of October, but the new variety begins near mid-October and continues to the end of December. Its keeping qualities appear to be satisfactory but have not been thoroughly tested.

Though this grapefruit has not been in the Dominion long enough to justify a final criticism of its qualities, there seems to be good reason to expect that its early promise as an attractive and well-timed addition to New Zealand-grown citrus fruits will be fulfilled. Trees are now much sought after by both commercial and private growers.



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Nitrite Poisoning in Cattle and Pigs

By A. D. M. G. LAING, *Veterinarian, Hastings, and* I. G. McINTOSH, *Toxicologist, Animal Research Station, Wallaceville.*

DURING the past 12 years sudden deaths of cattle and pigs after eating raw mangolds have been reported occasionally. If any symptoms have been noted at all, they have been staggering, rapid breathing, and sometimes convulsions, with collapse and death within an hour. Usually, however, the animals have been found dead by the owner, death having occurred so suddenly that no symptoms have been observed.

THIS type of poisoning, associated with the use of mangolds, has not been frequent, but during the autumn of 1946, when the drought broke, and in the winter and early spring, a substantial number of cattle was lost in Hawke's Bay. When symptoms were observed they were as described, together with occasional bloating, abdominal pain, and diarrhoea. Abortions occurred in some of the animals which recovered.

The only abnormalities noted in post-mortem examination were an engorgement of the surface blood vessels, visible when the carcasses were skinned, and an unusually-dark red or even chocolate-brown colour of the blood.

Danger of Thistles

In a number of these cases no mangolds had been fed out, but the animals, usually hungry run cattle, had been turned on to land where either winged thistle (*Carduus tenuiflorus*) or variegated thistle (*Silybum Marianum*) had grown so vigorously that the pasture was seriously reduced and thistles were the only feed available. This article emphasises the dangers of allowing a further spread of thistles through the country and indicates measures to prevent loss of stock turned on to thistle-infested pastures or given a supplementary diet of mangolds.

No similar trouble with either sheep or horses has been reported.

The disease is not restricted to New Zealand, very heavy losses having occurred in New South Wales when hungry cattle were allowed to gorge themselves with thistles. In America heavy losses have followed the feeding out of oat hay. To date only one such case of oat-hay poisoning has been reported in this country. Usually mangolds and oat hay can be fed out and thistles can be grazed with safety, but occasionally circumstances arise which may lead to poisoning and loss of stock.

Trouble occurs when the plant has developed a high concentration of potassium nitrate, a salt which is present in varying amounts in all plants, the amount being governed by the species of plant, the fertility of the soil, the stage of growth, and the climate. Generally, high fertility, rain after a drought, and young growth favour a high nitrate content.

The salt is very like sodium nitrate (the Chile saltpetre of commerce) in its chemical properties and is used medicinally. Normally its toxicity is low, and in the animal most of it is changed into harmless products or excreted unchanged in the urine; an insignificant amount is usually converted to poisonous material. Where it occurs in plants it is usually accompanied by a corresponding amount of a substance called an enzyme, which can convert the relatively-harmless nitrate into a poisonous material known as nitrite. Furthermore, certain soil bacteria and some which are normal inhabitants of the digestive system of an animal also have to a limited extent the power of converting nitrate to nitrite.

Hence, when an animal eats a large amount of a plant with a high nitrate content together with sufficient associated enzyme, conditions are favourable for the formation of large and possibly dangerous amounts of the poisonous nitrite.

Effects of Poison

The effects of the nitrite are palpitation—dilation of the blood vessels throughout the body, necessitating an increase in the rate of heart beats; and an action on the red blood corpuscles which prevents them from carrying out their function of absorbing oxygen in the lungs and carrying it for use throughout the body. When that action has reached a certain point the animal dies from lack of oxygen—suffocation; if that point is not reached, the animal recovers in a few hours. However, in a pregnant animal

[Hawke's Bay News-Photo Service.

Winged thistle should not be allowed to spread. When no other feed is available cattle will eat this thistle with consequent danger of nitrite poisoning.

[*Hawke's Bay News-Photo Service.*

Variegated thistle in Hawke's Bay.

the foetus is likely to be killed, with consequent abortion of a dead calf in 2 to 3 days.

Fortunately no chronic poisoning occurs, and an animal can receive a nearly-poisonous amount daily without suffering any harmful effects. Should the margin be exceeded at any time the animal will react in the same way as one receiving a single poisonous dose.

There is no method by which a farmer can tell whether any of the foods mentioned are dangerous, and even in the laboratory toxicity can be only partially appraised.

Precautions Against Poisoning

Symptoms of poisoning after the consumption of thistles or mangolds have usually been connected with hungry stock having free access to such food, or with stock unaccustomed to them being allowed over-large quantities. Therefore poisoning should usually be preventable by taking care that such foodstuffs are not fed out too freely to hungry stock. Cattle should be allowed access to good mature grazing, or meadow or lucerne hay, before going on to mangolds. The same applies to country where thistles are the predominant grazing.

If the measures advised are not possible because of a shortage of supplementary feeds, the farmer must resign himself to a policy of severely curtailing the intake of new feed, mangolds or thistles, gradually increasing it over a period of 5 to 7 days. In that way the risks of stock gorging themselves, with consequent danger of nitrite poisoning, seem to be greatly lessened, though not necessarily eliminated.

When groups of cattle or pigs are being fed on mangolds for the first time and a number refuse to eat, as is not infrequent, the remainder will have more than their allowance, possibly with disastrous results. The "pitting" of mangolds does not seem to prevent them from causing nitrite poisoning.

Treatment of Affected Stock

If symptoms of poisoning are observed, both healthy and affected stock should immediately be taken off the feed causing the trouble. Mature grass, if available, or plenty of good meadow or lucerne hay should be fed as required. If possible a veterinary surgeon should be called in at once. If called in time, he can give injections which will save fairly-advanced cases. If run cattle are affected, however, cattle yards must be at hand to allow of handling them.

Empire Oil Resources

The Anglo-Iranian Oil Company, Ltd., which constitutes a vital keystone in the economy and defence structure of the British Commonwealth today, holds a 49 per cent. interest in the recently-formed British Petroleum Company of New Zealand. It has been solely responsible for the development of the immense oil resources of Iran—among the richest in the world—to which the company has an exclusive concession. In addition, the company has a half interest in the Kuwait concession in the north-western corner of the Persian Gulf and a $23\frac{3}{4}$ per cent. interest in the Iraq Petroleum Company. Through its wholly-owned subsidiary, D'Arcy Exploration Company, Ltd., the company is also active in oil exploration in the United Kingdom, fields having been developed at Eakring, Nottinghamshire, and Formby, Lancashire, from which the total production up to the end of 1946 amounted to over 500,000 tons of first-quality oil providing a particularly good base for the production of lubricants.

The scope of the Anglo-Iranian Oil Company's activities is of outstanding importance in the petroleum industry. In its initial stages the company was concerned with production only. It was formed in 1909, when it was known as the Anglo-Persian Oil Company, to acquire a concession granted by the Persian Government giving it exclusive right to exploit the petroleum deposits throughout the Persian Empire (with the exception of the four northern provinces bordering on the Caspian Sea) for a period of 60 years from 1901. This concession was cancelled in 1932 and in 1933 the Persian Government granted the company a new concession covering 60 years to 1993. Keeping pace with its growth and development, the company widened its scope of service until today, either directly or through its subsidiaries, it is interested in every branch of the oil industry from production to the marketing of its products in many parts of the world.

For example, the company owns or operates through subsidiary and affiliated interests nine refineries in various parts of the world. The famous Abadan refinery on the Persian Gulf, owned and operated by the company, is described as the largest concentration of oil-refining capacity in the world, with an output of over 15,000,000 gallons a day and a current capacity of 20,000,000 tons a year.

The ordinary stock interest of the company is £20,137,500, of which the British Government holds £11,250,000 and the Burmah Oil Company £5,342,985. Chiefly because of the foresight and enterprise of Mr. Winston Churchill, then First Lord of the Admiralty in the Asquith Cabinet, the British Government in May, 1914, decided to take an active interest in the oil business and entered into an agreement with the Anglo-Iranian Oil Company, Ltd. whereby they acquired a majority shareholding in the company.

Apart from the inestimable strategic value of Britain's interest in the Iranian fields through two major wars, an indication of what the British Government's interest in Anglo-Iranian has meant to the British taxpayer was given in the House of Commons in the late thirties by Sir John Simon when, in answer to a question, he stated that returns to that date on their original investment of public money in the company had already amounted to £15,989,354. Subsequent progressive trading has allowed this figure to expand to well over £35,000,000. Today Britain's oil interests in the Middle East have a further direct value, enabling her to draw a considerable proportion of her oil requirements from British fields and thus conserve much-needed dollar reserves.

HILL-COUNTRY FARMING IN BRITAIN

By **G. A. HOLMES,** *Agricultural Liaison Officer, New Zealand Government Offices, London.*

NO mountains in Britain are comparable in height with the peaks of New Zealand's Southern Alps or Lakes District: Ben Nevis reaches to only 4406ft. and Snowdon to 3560ft., compared with Mount Cook's 12,349ft. But the effect of altitude is much more marked in Britain than in New Zealand, and it is noticeable that the improvement of hill land above the 1000ft. contour is rarely attempted. The natural vegetation changes rather sharply at about that altitude, above which the climate seems too cold for bracken to grow and unsuitable for afforestation with many species of trees which are quite successful at lower levels.

SOME 17,000,000 acres are classified as mountain and hill grazing—5,000,000 acres in England and Wales and 12,000,000 acres in Scotland. A good deal of it is too rocky, shallow, or rugged for improvement as grazing land, and it will no doubt be used for forestry under a plan which has the objective of planting 5,000,000 acres during the next 10 years. In the past the Forestry Commission usually selected the valleys and warmer slopes of the hills for its plantings, but it is now investigating the use of hardier species of trees which will thrive at higher altitudes and on the colder northerly slopes.

The post-war plan is designed to make forestry and farming of mutual assistance rather than in opposition, and it is hoped that plantation work will prove of great assistance in maintaining employment during periods of the year when casual labour is not required on farms.

Some of the high land in Britain is not suitable even for forestry, as it is covered by deep peat which, as a rule, cannot be drained cheaply and provides only a little summer grazing for sheep and cattle. That is the condition of a good deal of the Scottish Highlands, where some millions of acres were occupied as deer "forest" (though trees of any size are noticeably absent) or as grouse-moor.

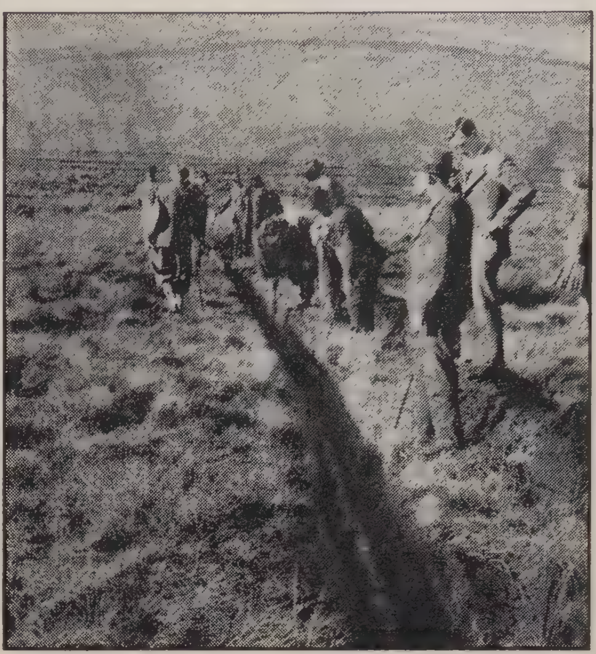
Heavy Summer Rainfall and Severe Winters

All the high country of Britain suffers from excessive summer rainfall precipitated from the moisture-laden prevailing westerly winds; the rainfall rises from about 35in. at sea level to 80in. or more at 1500ft. in Wales and the western Highlands. The winters are frequently severe and the snow may lie for several weeks, involving hand feeding of sheep and cattle. Many of the holdings produce only limited quantities of hay, so if the winter is severe, either the stock are half-starved or the cost of bringing hay from the farming districts makes wintering very expensive.

The death rate also appears high, especially among hoggets, figures as high as 50 per cent. being quoted for hoggets wintered on the hills. To avoid that the practice has arisen of sending hoggets to lower country to winter on pastures grazed during the rest of the year by dairy cows. However, the cost is now much higher than in pre-war years and is a heavy expense to the hill sheep farmer—20s. to 25s. a head for the four winter months.

Small, Unprofitable Holdings

After allowing for the types of land mentioned which are outside the margin for economic improvement, there still remain millions of acres of hill land which appear to offer reasonably good prospects. Until the outbreak of war livestock farming in Great Britain had been comparatively unprofitable for about 70 years, and the legacy of that long period of depression is particularly noticeable in the derelict condition of much of the hill country. It could not benefit from mechanisation in the same way as ploughable land, and its products were at the mercy of competition from imports. Many holdings seem to be too small to give a reasonable living for the family; a typical farm might consist of only 60 or 70 acres in small paddocks, with the right to run perhaps 200 ewes "in common" on the mountain or moorland.



The reclamation of peat bog on high country. Open ditches have been cut by a special ditching plough at intervals of 15 yards, costing about 26s. an acre. The area will later be burnt and surface sown.

The breeds of stock kept have the virtue of hardiness, but are usually slow maturing and unprofitable by present-day standards. In the Scottish Highlands and border counties the Scotch Blackface constitutes the standard breeding flock. Her hairy coat turns the rain and her feet remain sound even on very boggy ground, it being held that the germicidal properties of peat give effective protection against foot-rot. She is perhaps the only sheep which could thrive on the sparse growth provided by shoots of heather. In the North of England other breeds are used on hill country, but most appear to have a considerable infusion of Blackface blood. The Swaledale, the Lonk, and the Run Fell have their supporters in different parts of the country. In Wales the Welsh Mountain breed is considered the only one which will suit the conditions, and no one thinks of trying any alternative.

Subsidies on Hill Farming

The first major scheme for the assistance of hill farming on a national basis was the Hill Sheep Subsidy, introduced shortly before the outbreak of war in an endeavour to prevent further deterioration of hill farms. Under this Act a grant of 7s. 6d. was given for each breeding ewe of one of the specified hardy breeds kept on a farm throughout the year. It was an expedient introduced in recognition of the fact that hill farmers' costs had increased out of proportion to returns.

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Its effect in some cases was not altogether beneficial. On some holdings more suited to cattle and wethers than to breeding ewes an attempt was made to carry more ewes, with the result that the death rate increased sharply and the growth of bracken fern was not checked, so that in a few years the carrying capacity fell.

When this trend became recognised an effort was made to encourage the keeping of more cattle on the hills by granting a subsidy of £3 10s. a head for each cattle beast maintained on a hill farm. That measure was introduced in 1942, but its benefit to hill farmers was largely offset by further rises in costs.

Toward the end of 1946 the Hill Farming Bill passed its third reading in the House of Commons and has now become law. This is a more ambitious project under which there has been voted a total of £5,000,000 for schemes of land improvement which hill farmers wish to undertake. Subject to approval of the scheme by the controlling authority, the State will pay half the total cost; permissible improvements include roading, fencing, draining, and provision of shelter, farm buildings, or cottages, as well as cultivation, liming, and reseeding of the land. Any scheme submitted must be complete in itself and must have reasonable prospects of enabling an increase in carrying capacity.

It is too early to say whether the Hill Farming Act will be really effective in encouraging land improvement. If advantage were taken of it widely, the sum voted would not go very far. It is considered by some hill farmers that to pay even half the total cost of regrassing would be uneconomic.

Typical North of England hill country about 2000ft. up on the borders of Westmorland and Cumberland.

Lime and Phosphate Deficiency

A great deal of the hill land is very deficient in lime and phosphate and high wages make the cost of spreading lime very expensive. Pasture seeds of good strain which will persist to form a fairly permanent sward are also very expensive, and in some cases cheap seeds mixtures have been sown with very poor results.

It is also well recognised that a programme of reclamation and reseeding must be consistently followed for a period of years and that the stock must be built up in numbers and quality to keep pace with the improvement in pasture production. Conditions in the past have not encouraged this necessary long view, and it is doubtful if there is sufficient confidence in the future to warrant a wide adoption of land improvement under such difficult conditions as are seen in parts of Britain.

Hoggets of the Rough Fell breed on poor upland peat pasture, mainly moss, deer grass, and *Molinia*. Across the valley on clay land browntop is gradually taking charge to give a close sward of higher carrying capacity than the weed grasses it is replacing.

Interest to New Zealand

Farmers in New Zealand should follow with interest developments which are the outcome of the passing of the Hill Farming Act. It is possible that some of the methods now being tried experimentally in Britain may be adapted for use under similar conditions on second- and third-class hill country in the south of New Zealand.

They should also be interested from another point of view: Any large-scale developments in reseeding hill land in Britain will provide a new market for substantial quantities of New Zealand-grown grass and clover seeds.

[*Photographs by "Farmers Weekly."*

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SUCCESSFUL WINTERING OF BEES

TO ensure a good honey crop in the following season special care and attention must be given to bee colonies in the winter. In this article R. S. Walsh, Apiary Instructor, Auckland, describes the manner in which bees winter and deals with the steps which must be taken to safeguard the health of colonies.

SUCCESSFUL wintering of bees can be achieved by observing certain basic principles in preparing the colonies for winter. The colonies should possess good queens and a large population of young bees supplied with ample good-quality stores and sufficient pollen. Adequate protection should also be provided. As the success of the honey crop the following season depends on good wintering conditions, every attention should be given to this phase of colony management.

The Winter Cluster

Bees become less active as the temperatures fall in the autumn, and when winter sets in and the hive temperature nears 57 degrees F. the bees form a cluster as a protection against any greater degree of cold. Temperatures vary according to seasons and localities, but if the temperature could be maintained at exactly 57 degrees throughout the winter the activities of the bees would be almost at a standstill regardless of outside influences. When temperatures fall below this point the bees must produce heat by activity as a protection against the cold. The cluster is roughly spherical shaped, the outer portion being made up of three layers of interwoven bees. This prevents cold air from making direct contact with the inside bees and also conserves heat in the centre of the cluster. Beeswax is a slow conductor of heat and is of great assistance to the bees in the maintenance of temperatures in winter.

The cluster normally covers about five frames, a proportion of which must contain empty cells located below stores of honey. The cluster reduces as the weather becomes colder, and the surface area decreases, which tends to slow down the rate at which heat is lost. Of great importance is the fact that the cluster can move only within certain limits at temperatures below 57 degrees F. and retain its formation. Movement can be made in backward, forward, or upward directions between the combs but not sideways across the combs unless the temperature is above 57 degrees F.

In extremely low temperatures the inability of the cluster to move sideways could result in the death of the colony, with honey available in the outside combs. The natural movement of the cluster during the winter is upward into the upper brood or food chamber.

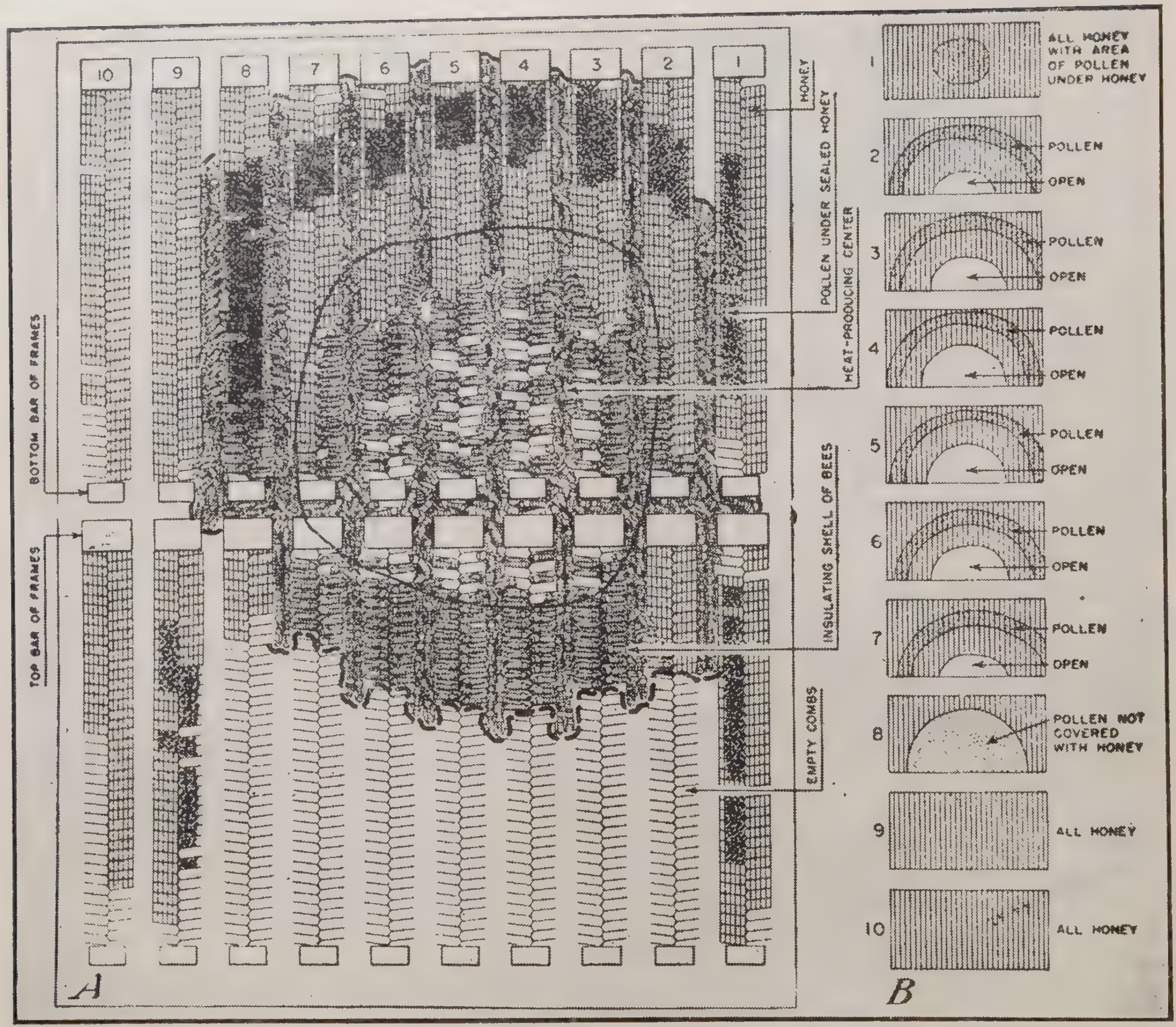
Throughout the winter there is a constant interchange of bees between the outer circle and the centre of the cluster, where the bees are engaged in the creation of heat. To produce the necessary temperature the bees must consume stores and expend energy, and it is for this reason that young bees are so essential for successful wintering. Good-quality stores are needed for the production of heat, and reasonable shelter, freedom from draughts, and first-class equipment are necessary for protection. Lack of adequate protection would increase the necessarily-heavy drain on the energy of the bees, which are unable to rebuild tissue like other creatures.

It has been demonstrated that bees are able to produce the temperature necessary to protect themselves against the rigours of winter by the consumption of stores which they convert into heat. This should indicate to beekeepers that ample stores left on colonies for the winter, besides being necessary, are indeed a cheap insurance for the honey crop the following season. Experiments have proved that it takes 5lb. of honey to carry 1lb. of bees through until spring nectar sources are available. A strong colony would enter the winter with from 7lb. to 8lb. of bees, the minimum food requirement of which would be 40lb. of honey. This does not take into account the young bees produced in the early spring, when the consumption of stores is about one frame for every frame of bees raised. When the stores of a colony fall below 15lb. in the spring brood rearing is greatly curtailed.

Quality of Stores

As the cluster cannot move sideways in hive temperatures of below 57 degrees F., it is important that beekeepers in inland districts of the North Island or the far south should pay particular attention to the location of stores in the hive. The honey should be placed above the cluster so that it will be available to the bees

A well-situated apiary.



[Reproduced from Circular No. 702, U.S.A. Dept. of Agriculture.

A—The position of the cluster and winter stores. Note the concentration of bees between combs, forming a compact, insulating shell round a less compact, heat-producing centre. B—Face view of combs in the top box, correspondingly numbered.

when temperatures drop to a low level. Winter stores should consist of honey of good quality, as poor-quality stores contain indigestible matter which is accumulated in the bodies of the bees and cannot be voided until the weather permits them to take a flight. During a prolonged period of unsettled weather such an accumulation may seriously affect the health of the colony by causing dysentery. Granulated honey may produce the same result, as this requires an excessive consumption of water to gain sufficient sugar.

Need of Pollen

The protein requirements of bees are supplied by the consumption of pollen. For their proper development the larvae must have a diet in the correct proportions of carbohydrates, protein, fats, water, and minerals. A dearth of pollen during the period of spring brood rearing can result in a setback to colonies, causing a check in brood rearing which would be reflected in a lowered honey crop during a normal summer. Unsettled weather during the spring may restrict the development of pollen-yielding plants and where heavy frosts are experienced the blossoms may be killed outright. High temperatures and drought conditions at a later period may also reduce the pollen supply. After the honey flow has ceased bees will gather pollen until well into the autumn. They never pack the cells with pollen, but only partly fill them and cover the pollen with honey. The keeping qualities of pollen are not high and, unless covered with honey, the pollen is liable to become mouldy and unfit for use by the bees. When bees are being wintered down the amount of pollen in the hives should be checked over to provide against any possible shortage in the following spring. The estimated pollen reserves in each hive should amount to between four and five full-depth frames.

IMPROVISED POWER HOIST FOR STACKING HAY

THAT the ability to improvise, even in this mechanical age, still stands the farmer in good stead is clearly demonstrated by the ingenious method used in the operation of a stacker grab on the farm of Mr. R. Henderson at Kaipara Flats.

Long experience with haymaking convinced Mr. Henderson that the old-fashioned horse-operated hoist left much room for improvement. The alternative method of substituting a tractor or an old car to operate backward and forward in precisely the same manner as the horse was also, he felt, not altogether satisfactory. It would be better and more convenient, he thought, if the tractor could be used to operate the hoist from a stationary position.

The way this could be done was found to be surprisingly simple. As will be seen from the accompanying illustrations, the power for the hoist is obtained from one of the rear wheels of a tractor jacked up to give ground clearance. The other wheel, resting on the ground, is not blocked, but its brake pedal is lashed down hard to prevent movement.

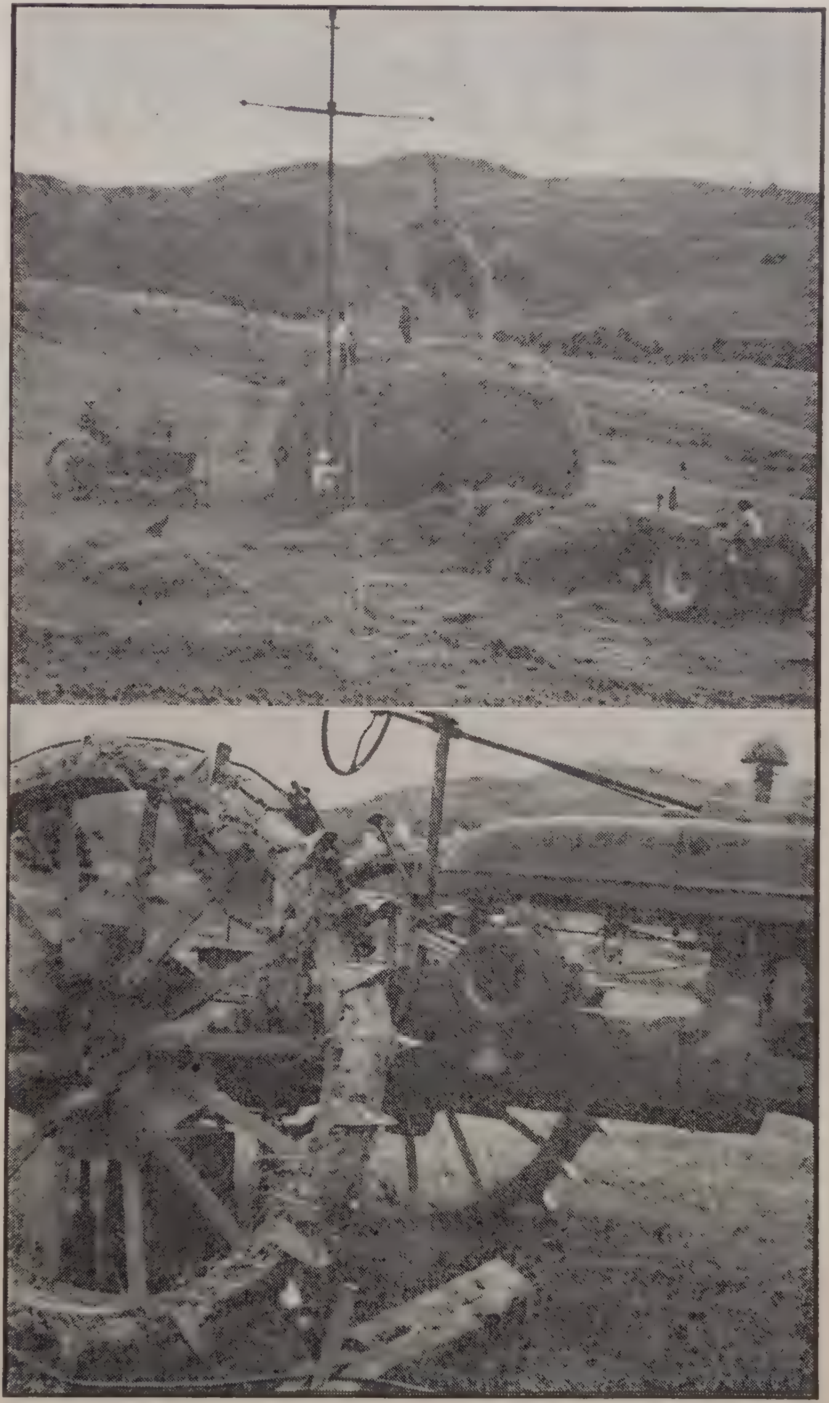
The end of the cable from the hoist is firmly secured to the raised tractor wheel by a chain, and is led round the rim between the spuds. It is bound to the rim by a piece of rope which is at the bottom of the wheel when the grab is extended to its point of greatest reach from the bottom of the mast. This prevents the cable from unwinding too far or slipping off the wheel each time the grab is lowered. The cable is guided on the wheel by being passed under two crossed pegs driven into the ground in front of the wheel and in line with the middle of the wheel and the mast.

The operation of the hoist is very simply and efficiently controlled by the tractor gear lever, clutch, and brake. Because the load at most is only about a one-horse load, the power used is relatively small, and as the low gear is employed, there is little strain on the tractor mechanism. It is easy to operate and gives complete control of the load. Furthermore, it does not score the paddock with a series of tractor marks, and it is fast—it easily outpaces a tractor sweep even where the crop is heavy and the travelling distance short.

The tractor used by Mr. Henderson has a 25 h.p. engine and 51in. rear wheels. The cable winds cleanly and freely between the spuds, and because of the large diameter of the wheel it does not bend too sharply.

The tractor hoist may not perhaps be completely fool-proof, but Mr. Henderson claims that with an alert operator at the controls it is at least as safe as any of the conventional methods of operating a grab.

P. S. SYME,
Instructor in Agriculture, Warkworth.



Upper—The hoist being used in the construction of a haystack. The tractor on the left is operating the hoist and the one on the right is sweeping hay to the stack. Though the crop is heavy, the power hoist outpaces the sweep. Lower—Close-up view of the tractor operating the hoist. Note the chain attaching the cable to the wheel and the cross peg guide for the cable. The brake of the wheel on the ground is lashed in the "on" position to the pulley shaft. The jack and block on which the tractor rests can be seen underneath the axle.

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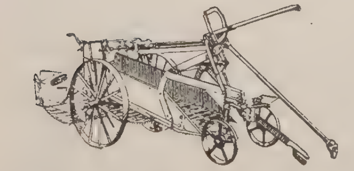

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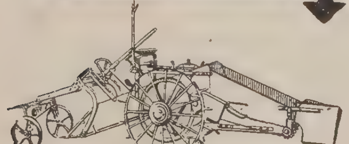

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THE HOME GARDEN IN MAY

By R. G. HAMILTON, *Horticultural Superintendent, Auckland.*

WHAT to do in the vegetable garden in May is often a problem to the home gardener. Planting and working in the garden come naturally to most people in the spring and early summer, when vegetable crops grow and mature with reasonable success even for the unskilled gardener. However, from February onward careful planning is necessary and success depends more and more on skilled attention.

BY May too many gardens are just vacant plots; that in many instances is the result of the enthusiasm for gardening having waned by this time of the year, or because the gardener does not know what to plant in the autumn.

But garden tools should not be put away yet, for there is much to be done.

Because of its position and soil conditions not every garden lends itself to winter operations, but much can be done toward improvement by raising the beds for better drainage and soil warmth. Where shelter is inadequate endeavour to provide additional protection from the cold winds. Growth depends on soil warmth, and in winter two of the greatest enemies of soil warmth are saturated soil and cold winds. Heavy, puggy soils may be improved by the addition of sand.

Planting

Though May is usually regarded as a slack period mainly devoted to cleaning up, several vegetables may be planted, especially in the warmer districts and in sheltered positions.

Broad beans for spring cropping should now be sown in a heavy, deep soil which, for preference, has received a dressing of well-matured compost. Dwarf varieties are advisable for gardens exposed to frequent winds. Sow 3in. deep in double rows 6in. apart with 6 to 8in. between seeds; allow 30in. between the double rows.

Lettuce may be planted in warm positions on raised beds. Be sure that the bed is protected from cold winds or growth will be disappointing.

Onions: If a sowing of onion seed for spring transplanting has been overlooked, there is still time if soil conditions are suitable and the climate is not too cold. Sowing should not be delayed any further, however. A well-drained, sandy loam provides the most suitable soil condition. The bed should be worked to a very fine tilth before the seed is sown. It is most important to keep the bed weeded from the time the seedlings appear.

Cabbage: Spring varieties of cabbage may be set out, and the plants will benefit at this time of the year if they are planted in raised beds or along raised rows 6in. high and 6in. wide at top. Rows should be 18 to 24in. apart. A mixed fertiliser consisting of 2 parts of blood and bone and 1 part of superphosphate should be spread at the rate of 1oz. to each foot of row before the cabbages are planted. Plants may be set out 12 to 15in. apart in the row.

Cauliflower: In the warmer climates cauliflower may be planted out for early summer harvesting. These plants can also be grown to advantage on raised beds or rows at this time of the year. More room is required than for spring cabbage, and rows should be 24 to 30in. apart with plants 18 to 24in. apart. Manuring should be heavier than for cabbage—about 1½oz. of cabbage mixture to each foot of row, and supplementary side dressings with 2 parts of sulphate of ammonia and 1 part of superphosphate to provide a well-grown curd. It is essential that cauliflower be grown without a check.

Asparagus: The top fern growth of asparagus may now be cut back to within an inch of the soil and burnt, and the ashes spread over the bed. Asparagus requires liberal manuring, and dressings should be applied after cutting of the spears has ceased and again in the spring. Compost, especially that made with a good proportion of seaweed, is very beneficial and should be spread over the bed and forked into the soil in the early spring, taking care not to fork too deeply above the crowns.

Rhubarb: Rhubarb responds to heavy manuring. The bed may now be tidied up and given a good dressing of compost, stable manure, or blood and bone manure and lightly forked in.

Celery should be sprayed regularly at 10- to 12-day intervals with Bordeaux mixture 3-4-50 to protect it from late blight.

Growing crops should be kept free of weeds and the ground stirred frequently to promote adequate aeration and the evaporation of excess moisture.

Late Harvesting

The last of the marrow and pumpkin crop should be harvested before the first frosts, and if not already collected, should be brought in without further delay. Only well-matured pumpkins should be selected for long storage, and they should be kept in a cool, dry, and airy position.

[Sparrow Industrial Pictures Ltd.

Spring cabbage planted out in May will provide supplies in the early spring.

THE HOME GARDEN . . .

May frosts will end the tomato season in most home gardens. If the crop has matured, the vines should be dug and burnt, or, if not sufficiently dry, they may be dug and left hanging to the stakes until dry. Should frosts come before the last of the crop has fully ripened, the vines may be cut a few inches above the ground and hung in a warm shed to ripen off fruits which are sufficiently advanced. As a general rule, burning tomato vines is much wiser than composting them because of the danger of their carrying disease.

Winter Manuring

During the winter growth tends to be sluggish, because the natural nitrogen-manufacturing processes in the soil slacken with cold, wet weather. Growing plants will be materially assisted during that period by occasional light dressings of a nitrogenous fertiliser, such as sulphate of ammonia or dried blood. Applications of liquid manure to leeks and celery will be of special benefit for their size and quality.

Green Crops

Ground should never be left vacant for any length of time between crops. Soluble plant nutrients may quickly be leached from the soil if the ground is left fallow. Whenever the period between crops will permit, sow some green crop such as lupins, oats, or mustard. A good crop of mustard for turning under can be grown in a week or two, but longer is required for oats and still longer for lupins.

[*Sparrow Industrial Pictures Ltd.*

Rhubarb is a gross feeder. Manure forked lightly into the bed now will carry the roots through until it is time to apply heavier dressings in the spring to promote the growth of long, succulent stalks.

[*Sparrow Industrial Pictures Ltd.*

Rubbish should be cleaned up and burnt.

Advantages of growing green crops for digging under and so enriching the soil with organic matter include the following:

1. Improvement of the water-holding capacity of the soil in dry periods.
2. Improvement of the water-absorption capacity of the soil, decreasing run-off and the tendency to erosion.
3. Improvment of drainage and soil aeration.
4. Improvement of soil structure.
5. Increase in the natural warmth of soils.
6. Provision of food and energy for the beneficial soil bacteria.
7. Provision of a "storehouse" of plant nutrients which become available over a long period as the organic matter decays.
8. Prevention of rapid leaching from the soil of the more soluble plant nutrients.

Cleaning Up

All rubbish should be cleaned up and burnt. Healthy crop residues can be composted. Stakes should be collected and stored until required next season.

Vacant ground required for early cropping should be dug over and given a dressing of 4oz. of agricultural lime to the square yard. If the land is not required for some time, dig it and sow mustard or oats.

See that drainage is sufficient to rid the soil of excess moisture quickly. Temporary open drains may be necessary to cope with winter rains.

Hedges can be given a final trimming for the season now and the trimmings composted.

The compost heap should receive some protection from the heavy winter rains.

Do not put gardening tools away dirty; wipe them over with an oily rag after use. Digging with a rusty, dirty spade is not only annoying but hard work. A little time spent on cleaning tools before they are put away is well repaid.

◆

Don't remain in doubt about the best methods of growing vegetables. Obtain a copy of Bulletin No. 229, "Vegetable Growing in the Home Garden," sent post free for 6d. from any office of the Department of Agriculture.

FARM WORK FOR MAY

By the Fields Division

CEREALS

In grain-growing districts at this time of the year work will be centred largely on the final preparation of the ground and the sowing of wheat. If the weather is favourable, most farmers, and more particularly those on the lighter class of land; prefer to sow wheat in May. The initial cultivation of the ground will have been started some months previously, and usually all that is required now is perhaps one or two grubbings, and a harrowing before sowing. A good depth of cultivation, with the finer soil underneath and the smaller clods on the surface, is recognised as ideal for autumn-sown wheat.

Certain pockets of land are particularly suited to special varieties such as Dreadnought, Hunters, or Jumbuck, but for the majority of wheat growers the choice will lie between Cross 7 and Fife Tuscan. In general, farmers on land capable of producing 35 bushels an acre or better will favour Cross 7; on the lighter land Fife Tuscan will be more popular. Many of the larger wheat growers sow both Cross 7 and Fife Tuscan. That is a good policy, for not only does it tend to spread the harvest, but seasonal conditions often favour one or the other of those varieties.

To control ball smut practically all wheat is now dusted with a mercurial dust before being sown. Some farmers have facilities for treating their own seed, but most of the dusting is usually done by either portable or stationary seed-dressing plants. The dust is applied to the grain at the rate of 2oz. a bushel.

POTATOES

Continue digging potatoes as the crops mature. If the tubers are to be stored in pits on the farm for any time, make certain they are properly protected from frost and other conditions likely to damage them. Baled wheat straw makes ideal sides for the pit. A good depth of straw should be used on the top of the pit, and a cover capable of turning the rain is also necessary.

RED CLOVER

Though the harvesting of red clover seed will have proceeded throughout April, May invariably finds many crops still untouched. Cowgrass usually matures first, with Montgomeryshire red clover a month or so later.

Various methods of harvesting the crop are used, depending largely on the weather, the state of the crop, and the equipment available. Many farmers who own header harvesters prefer direct heading, maintaining that if they can wait for suitable weather the saving of time and labour compensates for any loss of seed. Others windrow the crop with the aim of drying out the green leaf at an earlier stage; that is done chiefly where circumstances compel reliance on contract machinery. The old method of cutting, stacking, and threshing from the stack in the spring is still used, even where modern machinery is available; it is maintained that the extra seed saved, particularly in seasons when the weather is unfavourable, more than compensates for the extra work.

Red clover is usually harvested in the late autumn and early winter, when frequently the weather is unfavourable and difficulty is experienced in getting the crops in a fit state for threshing. Often the farmer's main concern is to get the seed in the bag, but even so every endeavour should be made during threshing to reduce cracked and damaged seeds to a minimum.

PASTURE MANAGEMENT

Continue topdressing with lime and phosphates, using the kind of phosphate which has given best results in the district. For many farmers that will be serpentine superphosphate, others will use superphosphate, and basic slag, if available, will find favour in some districts. Lime may also be applied in districts which are known to give a response to it. Soils deficient in lime usually give a better return for money expended in phosphates if lime is also used. In seed-producing districts areas intended for white or red clover seed next season will usually benefit from an application of lime if that has not already been done.

Young pastures which are sufficiently long should be grazed with sheep or young cattle, if available, to minimise poaching where conditions are wet. The trampling of the stock will consolidate the ground and assist in preventing frost lift. Light grazing of young pastures while they are still growing will also assist tillering. Old pastures can be harrowed to scatter accumulations of animal droppings.

MANGOLDS

Mangolds should be pitted now. Select a site for the pit convenient for the feeding of the mangolds to the stock during the winter months. When pulling the mangolds it is advisable to wrench off any green leaves. Do not feed them to stock until they have been in the pit for at least 6 weeks.

TURNIPS AND SWEDES

Much will depend on the weather, but if grass growth is scarce, a start may be made with the feeding of crops of soft turnips. For efficient utilisation crops should be fed off in breaks. Failing-mouth ewes are frequently put on crops first to clean up the turnip tops and other foreign growth. Ewe lambs for flock maintenance can be allowed to run over a whole block of turnips or swedes for the same purpose. If any lambs remain to be fattened, they can be finished off on the weed growth and turnip tops.

MACHINERY AND IMPLEMENTS

As soon as possible after the harvest has been completed all machinery should be put under cover, and as opportunity permits any repairs necessary should be undertaken. It is not advisable to leave repair work until just before the following harvest. Any implements not required should also be put under cover.

STOCK

In districts where foot-rot is prevalent all ewes should be turned up, their feet trimmed and all pockets in the hooves opened up, and then run through the bluestone trough. Lambs to be kept over should be drenched for parasites, their tails trimmed, and kept on clean feed. In districts where rams have been with the ewes for some time two or three fresh rams can be put out.

In high country where the rams are just about to be put with the ewes, ewes should be eye clipped and their tails cleaned up. Raddle the rumps of rams profusely—blue or red for easy sighting on the large ewe blocks on such properties. Ewe blocks should be ridden twice a week and mobs of ewes without rams mustered toward rams. Wethers should be eye clipped and put out on the winter wether blocks.

Calves for replacement in herds should be drenched if they are scouring, kept on clean feed, and fed on good-quality hay.

Herds will be concluding the milking season shortly, and all cows to be culled should be disposed of as soon as possible. Plenty of supplementary winter feed should be kept up to the herd to ensure the cows being in good condition for the winter and next milking season. Heifers coming to their first calf should be specially looked after and given favourable treatment.

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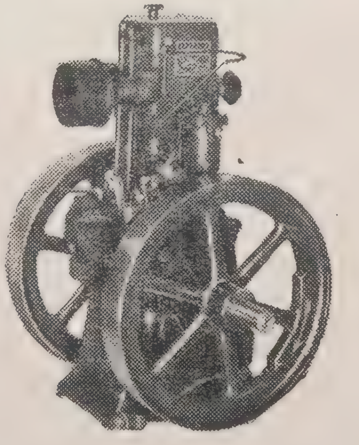

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LOGANBERRY CULTURE

By J. COOMBE, *Orchard Instructor, Christchurch.*

SINCE it was first grown overseas last century the loganberry has proved a valuable fruit, commanding the attention of pomologists and growers all over the world and being widely propagated and sold. This article, which describes how the fruit may be grown successfully and the methods necessary for care of the plants, will be helpful to both the prospective commercial grower and the home gardener.

THE loganberry originated in 1881 as a hybrid seedling grown by Judge J. H. Logan, of Santa Cruz, who crossed the Californian wild blackberry with a red raspberry thought to be Red Antwerp. The plant was multiplied by its originator, and fruited for more than 10 years. In the meantime plants were given to Mr. James Waters, of Watsonville, who, growing it on a commercial scale, was gratified at the results obtained from marketing the fruit. The variety was first given to the public by the University of California in 1893, and has since been widely propagated and sold.

The loganberry is an exceedingly-robust grower and has unique foliage and cane growth. Its fruit, which is strikingly large and handsome, sometimes measures up to 1¼in. in length, having the shape of an elongated blackberry and the colour of a dark-red raspberry. Its flavour is distinctive and has been said to combine the flavours of both blackberry and raspberry.

Location

In selecting a suitable location for commercial loganberry culture the grower must consider climate, labour supply, and transport facilities.

The climate throughout New Zealand is such that the loganberry could probably be grown successfully on a commercial scale in selected localities in all provinces, including the more northerly ones. In some areas slight damage may be done to the young tips of the foliage by hard frosts during very severe winters, especially when the canes have continued growing until late autumn and the wood has not had time to ripen thoroughly before heavy frosts occur.

The availability of labour is a most important consideration in selecting a suitable area, as an adequate supply of pickers must be available during the harvesting season. Picking generally begins shortly after the bulk of the strawberry crop has been harvested—from late December to the middle of January, according to the district—and extends well into February. Some growers have been able to use older school children engaged on the contract system to pick the crop, but sufficient local children might not be available in all districts. If loganberries are being grown in rural areas, some means must be found of making picking attractive and so encouraging an influx of holiday pickers.

The problem of finding adequate pickers should be solved before any large-scale plantings are contemplated by a grower in districts distant from centres of population. Proximity to market or factory is a great advantage and this should be considered before deciding on the location of a plantation. It is essential that facilities should be available for rapid transport of fruit to the markets or factory owing to its highly-perishable nature.

Soil Requirements

The loganberry will thrive on any deep, fertile, well-drained soil, whether of light or heavy texture, but the intermediate types of loamy soils are to be preferred. Deep, medium to heavy loam soil with no hard pan, but grading gradually into a retentive subsoil, is the most suitable. If the soil is of a light loamy nature, irrigation would probably be required to ensure success in most New Zealand districts, as the loganberry needs a plentiful supply of moisture during the period in which the fruit is forming and ripening. Without irrigation loganberries cultivated on such soils would be too dependent on favourable weather conditions, and yields would suffer severely in dry summers, when canes may collapse completely for want of water.

As strong winds damage the canes and increase the cost of keeping them trained to the wires, it is imperative that adequate shelter be provided before planting is commenced. Moreover, hot, dry winds in the summer can have a debilitating effect on loganberry canes, which should be sheltered in districts where these winds are likely to occur.

The site selected should also be reasonably free from heavy, unseasonable frosts, since a heavy frost in late spring will cause damage to the blossoms and an early frost in the autumn may damage the unripened buds on the new canes.

Drainage

Loganberries require an ample supply of moisture, especially during the growing and fruiting season, but they do not appreciate "wet feet" during the winter, though they can withstand temporary waterlogging better than raspberries. If an area is liable to flooding or waterlogging in wet spells, it should be drained by some permanent system like field pipes, which should be laid as deep as practicable to ensure the maximum depth of efficient drainage. There should be a minimum depth of at least 18in. of

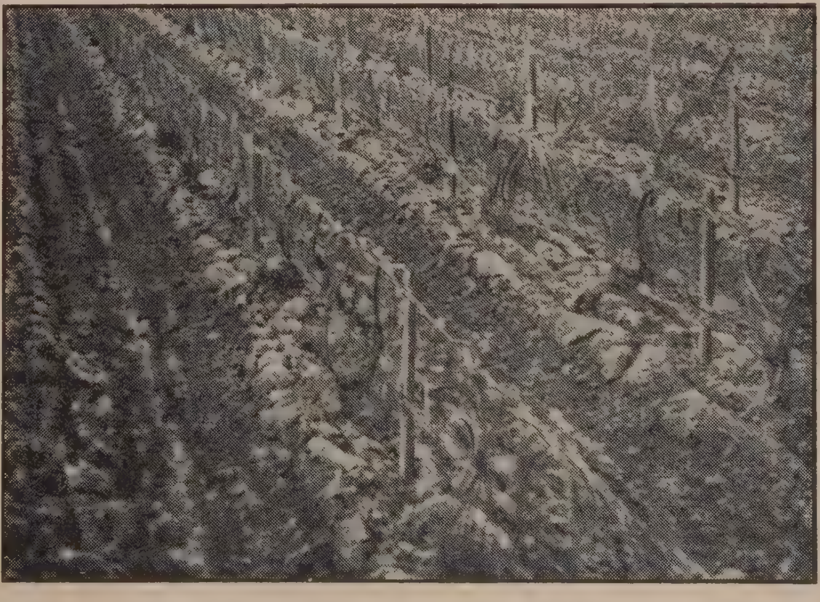

Fig. 1—A loganberry plantation that has been autumn ploughed to facilitate quick run-off of water.

METHODS OF TRAINING LOGANBERRY CANES

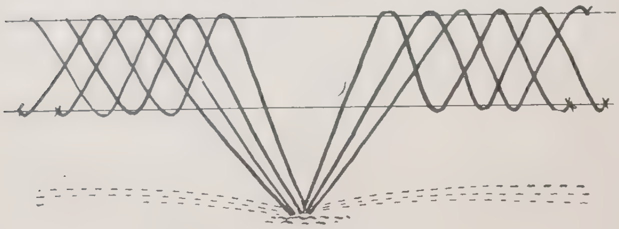

Fig. 2—The weaving method.

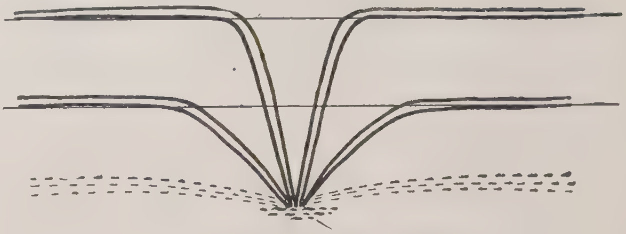

Fig. 3—The rope method.

soil above the level of the permanent water-table. **Expert advice should be obtained before installing a permanent drainage system, because the profitability of the plantation may be reduced if it ceases to work efficiently.** Ploughing up to the crowns in the autumn will also greatly assist in carrying off surplus surface water during the winter, provided there is some place into which the water can drain.

Preparation of Land

Once the vines have been planted out in their permanent positions further deep cultivation is not possible. The site should therefore be thoroughly prepared before planting. If the situation selected is in grass and spring planting is anticipated, the land should be ploughed during the autumn and sufficient time given for the turf to rot and frosts to break down the soil into a good friable condition suitable for planting. Regular, heavy crops of loganberries can best be grown in soils rich in humus. Should the area selected be lacking in humus, or soil fertility be low, the land should be put into better condition before planting by ploughing in one or more green crops or by applying a heavy dressing of animal manure, compost, or any other organic manure which may be available. Later cultivation and maintenance of the mechanical condition of the soil will be much easier if the soil is in good condition before planting and the rooting system will develop more rapidly.

All persistent weeds such as twitch, couch, or convolvulus must be eradicated before planting, as it is almost impossible to eradicate them once the plants have been put out. Subsequent cultivation is much more costly where weeds are allowed to persist and the plants are robbed of a certain amount of plant food and much of the moisture necessary for the production of the best fruits. A hoed crop, such as potatoes, taken off the land before planting, will put it into better physical condition and will reduce persistent weeds.

Propagation

Loganberries may be propagated by many methods, including tip layers, layering, and root cutting, but they do not produce rooted suckers in the same way as the raspberry. Tip layers may be obtained by burying the tips of the current season's cane in the late summer or autumn, when they have finished growing. These tips will be rooted and ready for severing from the cane early in the following spring and can then be lifted and placed in their permanent positions, or in a nursery row for one year. Many overseas commercial growers prefer to plant up stock which has been grown on for a year in a nursery rather than use freshly-rooted tip layers.

Production of tip layers does not in any way interfere with fruiting of the canes and is commonly carried out by commercial fruit growers. Seedlings should never be used as a method of propagating loganberries.

To secure plants by layering, the whole cane is laid in a shallow trench and covered with soil in the autumn. Roots are usually formed at the nodes along the cane, which is then lifted in the following spring and cut into pieces, each with roots and at least one bud. Root cuttings can also be used to produce plants by cutting the root into pieces 3 to 4in. long, and burying them for the winter in trenches 3 or 4in. deep. Leaf bud cuttings have been used overseas for the rapid propagation of new varieties of loganberries.

The use of tip layers is by far the most satisfactory method of propagation for normal commercial practice. One acre of loganberries should produce 3000 tip plants without interfering with the following season's crop.

Where loganberries are cultivated for propagating purposes and not for fruiting, plants can be set out 9 to 12ft. apart in nursery beds and the tip of every new cane rooted. All old canes are cut back to the crown every year, reducing the risk of carrying fungus disease over from one season to the next, and for this reason the use of special nursery beds is finding favour overseas.

Selection of Plants

There do not appear to be any named varieties of loganberries in New Zealand, although a number of closely-allied types such as Youngberry and Phenomenal berry have been grown here.

Regardless of the method used to propagate the plants, the intending grower should endeavour to secure stock which was propagated from vigorous, disease-free, and highly-productive plants. Young plants should be well grown and have a strong rooting system. The vigour and cropping capacity of the parents from which the stock was taken can be judged better in the summer at fruiting season than in the winter, when the canes bear neither fruit nor leaves.

Planting

If the new plants are received before the area is ready for planting, they should be heeled in carefully in a finely-cultivated, moist soil and cool situation to prevent the roots from drying out. To do this open up a trench of the necessary width and depth, lay the plants in the trench, work fine, moist soil in among the roots, and firm down. If plants are received in bundles, it is most important to open up the bundles before the plants are heeled in and so prevent the plants in the centre of the bundle from drying out. More damage is caused by drying out of roots of young canes than is usually realised.

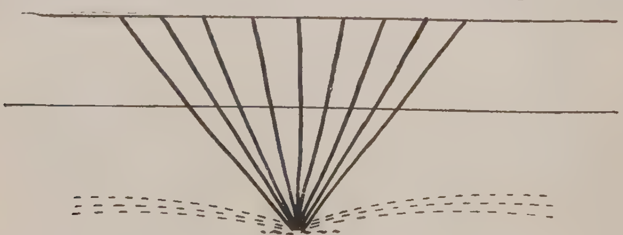

Fig. 4—The fan method.

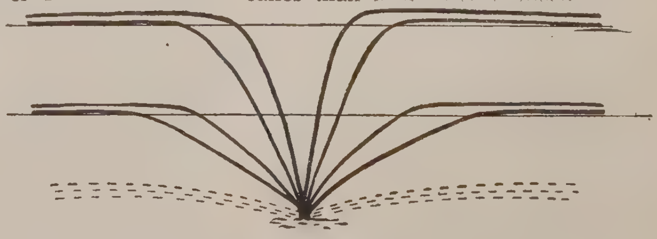

Fig. 5—A combination of the fan and rope methods.

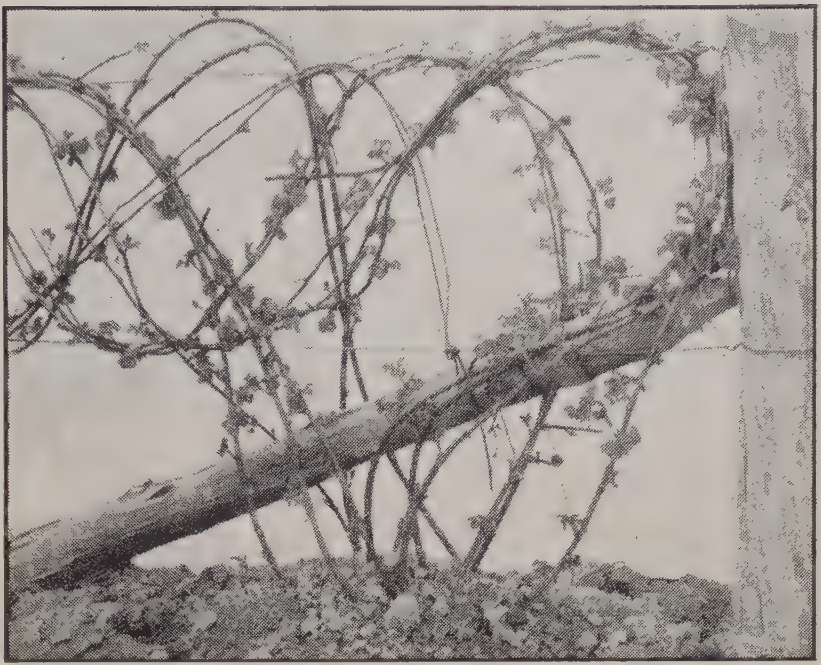

Fig. 6—Anchor stays should be mortised into end posts as high as practicable.

Provided the soil does not lie wet and cold, autumn planting of two-year-old stock has a definite advantage over spring planting. The winter rains settle the soil firmly around the roots and thus give the plant a much better start in the spring. A poor start after planting late, especially if a dry season is experienced in the first season, may give the plant a check from which it may never fully recover. If the land is too wet for autumn planting, it would be advisable to plant as early as possible in the spring rather than set the plants out while the soil is in an unfavourable condition for working. First-year plants will not, of course, be ready to plant until the early spring, but should be set out as soon as possible after being severed from their parents. Second-year plants should be cut down to within 9in. of the ground after they are planted.

Layout of Plantation

Before planting, the ground should be thoroughly prepared and carefully marked out so that plants and rows will be at the required distances apart; care must be taken to have the rows straight. If possible, the rows should run north and south to allow both sides of the vines an equal amount of sunlight. However, in some districts with strong prevailing winds from either east or west it might be advisable to have rows running from east to west to reduce wind damage.

In one of the largest plantations in the South Island the rows are spaced 6ft. apart and the plants are set at 9ft. intervals in the rows. **These distances are possibly the closest which are practicable for a commercial plantation, and it is usual to space plants more widely apart in the rows.** Unless there is adequate room for cultivation, spraying, and working in between the rows, a certain amount of damage to the canes is unavoidable; the operations also become more costly if the worker is cramped. The type of soil and climatic conditions determine to a large extent what distance apart the plants should be set. In a district having a long growing season or where the plantation is set on deep, rich, alluvial soil the distance between plants and the spacing of the rows should be greater than in a plantation set on a medium or poorer type of soil or in a district where the growing season is shorter.

To find the number of plants required per acre multiply the distance between the rows by the distance between the plants in the row, and divide the result into 43,560 (the number of square feet in an acre). Thus, 6 x 9 = 54; 43,560 ÷ 54 = 806 plants per acre.

Should the area to be planted be very long, it would be advisable to make breaks 10 to 12ft. wide at right angles to the rows at least every 5 chains along the plantation, otherwise the cost of carrying out the harvested fruit would become unduly high.

Start planting with the outside row first, leaving ample headlands at each end for turning cultivation implements, and set the plants at the necessary distance apart. The first plant in the second row should be set opposite a point half-way between the first and second plant in the first row—that is, on the diagonal with the first plant in the first row and not directly opposite. This method allows a more equal distribution of the root through the soil. Make sure the hole for the young plant is of ample size to allow the roots to be fully spread out. It should also be of such a depth that when the plant has been set the crown will be from 2 to 4in. below soil level. This will enable the plant to secure a better moisture supply if a dry season is experienced, and will also allow deeper cultivation without risk of disturbing the roots. Before the hole has been completely filled in apply from 1½ to 2oz. of blood and bone. Fine soil should be used to cover the roots, and the plant should be gently shaken to work the soil in among the roots. After the hole has been filled the soil should be firmed down by treading.

Useful Fruit in the Home Garden

The loganberry is one of the most useful fruits that the home gardener can grow, as the plant has a long life and returns large quantities of fruit. A plant receiving reasonable attention should give an annual return of from 7 to 10lb. of fruit. The fruit makes excellent jam, jelly, or pies, and is ideal for preserving.

A good place to plant loganberries in the home garden is along a trellis fence or any structure to which the vines can be fastened.

The distance apart varies according to the height of the structure along which the vines are to be trained. If a high trellis fence is being used, they could be planted about 6ft. apart, but if the structure is not more than 4ft. 6in. high, they would need to be planted at least 9ft. apart.

Cultivation

Thorough cultivation should be maintained with the grubber and harrows throughout the spring and summer to keep down weed growth and to conserve moisture. Cultivation close to the plants should always be more shallow than in the centre of the rows to avoid damage, and both near the plants and between the rows the depth of cultivation should always be so adjusted that the root system is undamaged. Particular attention should be paid to this point when mechanical equipment is used. During the early part of the first season cultivation may be carried out in three directions, providing no inter-cropping was done and the plantation is planted on the diagonal system. Hand hoeing would be greatly reduced by cultivating in this manner.

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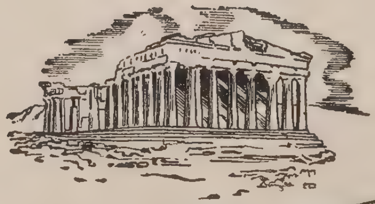

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A.1.10

CHECKING WEEDS ROUND LOGANBERRY PLANTS

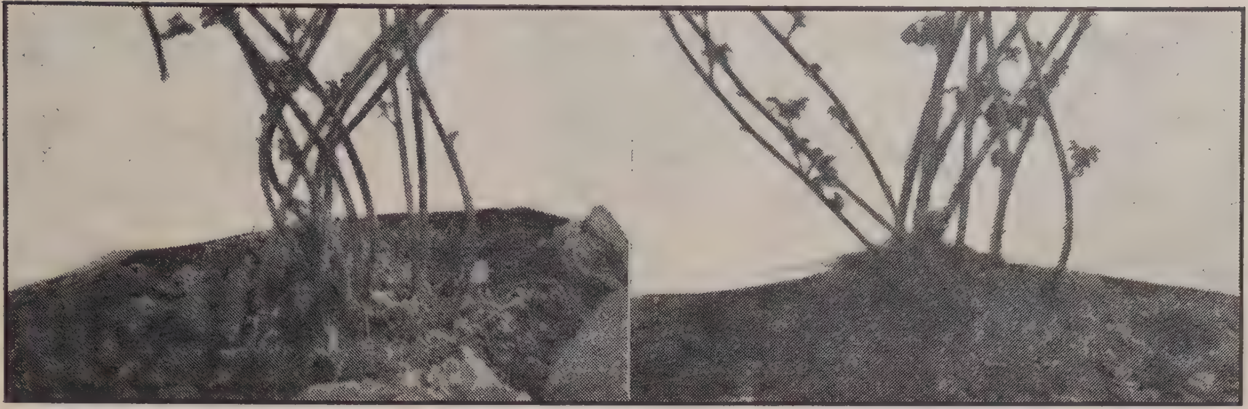


Fig. 7—The weed growth round the plant in the left-hand illustration can be checked by throwing fine soil over the crowns as shown in the right-hand illustration.

Inter-row crops may be grown during the first season after the loganberries are set out. The best crop for this purpose would be one that requires intensive cultivation and is harvested reasonably early, such as peas, beans, or potatoes. Only one row of inter-crop should be planted between every two rows of loganberries.

Training Methods

Various methods are used in training the canes—weaving, rope, fan, and a combination of the rope and fan systems. These systems can be used with a different number of wires, usually from two to four. Commercial growers in the South Island use the weaving method on two wires, because the maximum fruiting surface is exposed to the sunlight and easier harvesting and better disease control are obtained.

Heavy fencing posts are set well into the ground at each end of the row and are then anchored with stays. The posts should be sunk about 3ft. in the ground and should protrude about 5ft. above ground level. They should be canted slightly away from the rows before they are stayed and the stays should be mortised into the posts as high as practicable. Some growers have used concrete posts in place of the usual wooden ones. Intermediate posts are then placed in between (**not** at) every second or third plant along the rows. If it is intended to use two wires, one should be placed at about 2ft. 6in. and the other 4ft. 9in. from the ground. If three wires are used, they should be fastened at 2ft. 6in, 3ft. 9in., and 5ft. from ground level. In a district subject to high winds it would probably be better to reduce the height of the structure to about 4ft. Number 8 galvanised wire is usually used, preferably with strainers at both ends of each wire.

Select from 8 to 12 of the most vigorous vines of each plant for training, usually two canes to a wire in each direction from each crown, and cut all the others off at the base. **It is better to have 8 good canes to each plant than 12 weakly ones.** To train the vines by the weaving method, weave about half along the wires in one direction and the remainder in the other direction, taking the canes first over the top wire, then down under the bottom one, and up again to the top according to the length of the cane. Care must be taken not to fracture the canes in weaving them around the wires. Fig. 2 shows the method of training by weaving.

For training on the rope system the canes are divided into four equal lots and fastened to the wires as shown in Fig. 3.

The fan system, as shown in Fig. 4, does not allow the canes to be left as long as in the other systems.

Fig. 5 shows the method of training used in the combination of the fan and rope system.

The ends of the canes should be tied to the wires regardless of which training system is employed. Some growers use the ends of the canes for tying, but it is more usual to tie them with twine. Diseases, especially cane spot, are spread by spores which wash from infected old cane on to the new young cane as it grows during the summer. It has been suggested that much of this carry-over of disease could be avoided by some system of training which would keep the new cane always at a higher level than the old cane or by training along separate wires. Several systems of this sort have been worked out and put into commercial practice overseas with success.

Pruning

As loganberries fruit on lateral growths arising from one-year wood, the pruning consists in the main of cutting out all wood that has fruited. This should be done as soon as practicable after the fruit has been picked. Retain as many of the new growths as desired; from 8 to 12 are recommended. It is usual to allow the new canes to develop naturally and then cut out unwanted ones at pruning time or after tying in the selected new canes. This practice is followed so that there are surplus canes up to the time when canes for tying in are selected, and if one or two new canes are accidentally broken or damaged, their loss is not too serious. If, however, a system is adopted of handling the young canes in such a way that they are not liable to damage, it is better to reduce the new growths to the required number in early summer, when they first start to grow, rather than at the end of the season. The new canes are in this way encouraged to grow more strongly. Canes generally make from 10 to 20ft. of growth in one season. If they are longer than required for easy training, they should be shortened to the desired length. Sometimes the new canes send out laterals or side shoots; these should be cut back to within a few buds of the main canes or removed altogether. Pruning should be carried out as soon as the fruit has been harvested, thus allowing the new canes plenty of time to ripen. All prunings should be taken off the area and burnt so that any disease organisms with which they may be infected are destroyed. Strong thorn-proof leather gloves are required when handling loganberry shoots.

Care of Canes in Autumn

Young canes are very pliable at the end of the growing season in the autumn, and while in this state they should be trained to the wires. After the canes have been fastened into position the plantation may be lightly ploughed by throwing the soil up from the centre to the sides of the rows. This leaves a natural drain down the centre of each row to help in carrying off excess water, and maintains the soil in better physical condition. In the early spring some growers throw a little fine soil in and round the crowns, which checks weed

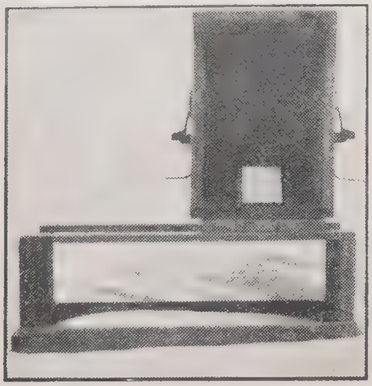


Fig. 8—A labour-saving device for lining fruit buckets with greaseproof paper or parchment.

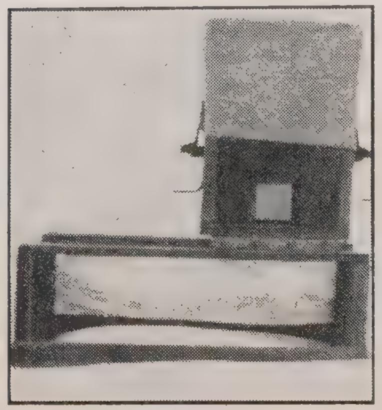


Fig. 9—Paper folded to the required shape and held by the small spring arms.

growth. This soil is hoed out later in the season after the mechanical cultivation has been done, to prevent the plants becoming mounded up too much. If inter-row ploughing is to be done, the plough should be set at such a depth that the loganberry roots are not damaged.

Manures and Fertilisers

Stable manure is strongly recommended as being the best material to use to maintain fertility and add humus to the soil. It also helps to conserve the moisture content of the soil during dry periods. If this material is available, the application of a good layer to the plantation in the autumn and working it into the soil in the spring will be found most beneficial. An annual dressing of 15 tons or more an acre would do much to ensure regular, profitable crops.

In those localities where stable or other animal manures are not available consideration should be given to the use of composted stack bottoms or any other form of plant refuse, either composted or applied direct to the soil. Cover crops could be used with advantage. Leguminous crops such as lupins, vetches, and peas add nitrogen to the soil as well as humus, and though the non-leguminous crops of barley and oats supply only additional humus, it is relatively simple to give an additional dressing of nitrogen. Where they are to be grown in situ, cover crops should be sown as soon as possible after training the vines has been completed. They do, however, interfere to some extent with routine work on the plantation, and growers are now considering the advisability of growing the green crops elsewhere and carting them on to the loganberry area.

The loganberry and raspberry have somewhat similar requirements for fertilisers and the following mixture recommended for raspberries is suitable for use on loganberries. It should be applied in the spring at the rate of 7cwt. an acre:—

	Cwt. per acre
Superphosphate, 44 to 46 per cent.	3½
Sulphate of potash ..	1½
Dried blood	½
Sulphate of ammonia ..	1½
Total	7

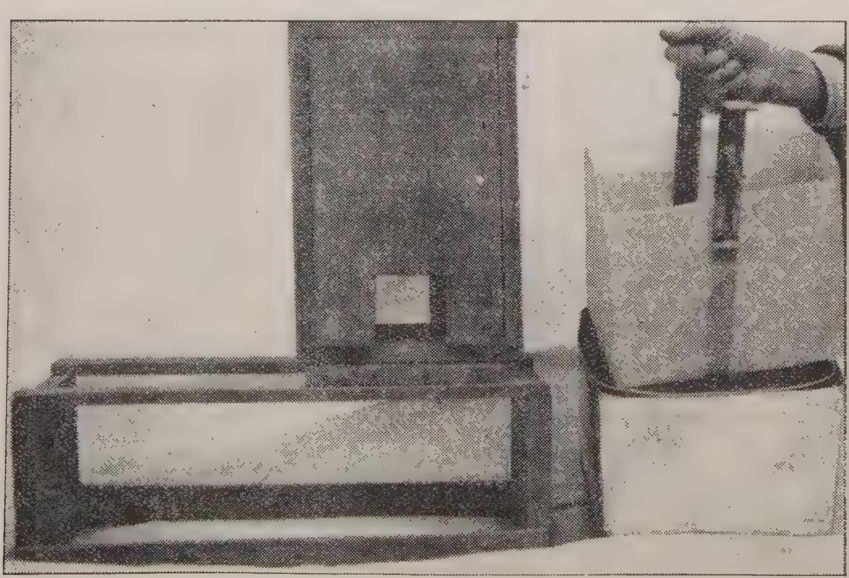
(If sulphate of potash is not available, other forms of potash may be substituted.)

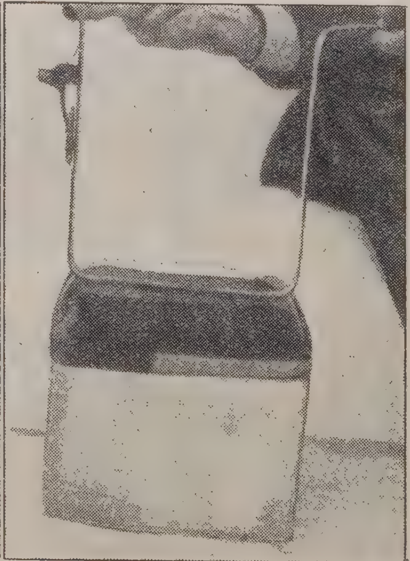
On the poorer types of soil the amount should be increased to at least 10cwt. an acre. The amount of fertiliser required will also depend to some extent on whether animal manures are being used and might well be reduced if the area is receiving heavy dressings of farmyard manure.

Loganberries succeed in a slightly-acid soil and there is probably no point in applying lime unless the soil is strongly acid. In fact, dressings of lime applied to neutral or alkaline soil overseas are reported to have caused a reduction in yield in the years following application.

Harvesting

In most seasons the fruit begins to ripen early in January in the North Island, and in mid-January in the South Island, just after the bulk of the strawberry crop has been harvested. Picking continues for about six weeks, finishing between the middle and the end of February. The fruit should be fully coloured and in a firm, ripe condition when picked. For distant markets the fruit should be picked when bright red, but for local or home consump-





Left: Fig. 10—Paper ready to insert in fruit bucket. Right: Fig. 11—The paper lining inside the bucket after release from the metal holder.

tion it should not be picked until it is dull purple. The fruits, which travel better than raspberries, retain their plugs and are usually picked without the calyx and stalk, though the latter may be left on fruit picked for display purposes. During the height of the harvesting season the whole area should be picked over at least once every four days if the fruit is being disposed of for jam-making and more frequently if the fruit is being sold for dessert purposes.

Tin buckets holding 12lb. of fruit are usually used for picking. The buckets should be lined with parchment or greaseproof paper before being used. Figs. 8 to 11 show a small device used by a Canterbury grower which speeds up this operation considerably and makes a very neat job. First, a wooden frame is made measuring approximately 18in. long x 9in. wide x 9in. deep. A box is then made over which the picking bucket will fit comfortably. This is about 15in. high and it is fitted to the frame with a bolt in the centre to allow it to be turned round as the operator folds the paper. A slot should be cut in the top of the box, otherwise the suction will collapse the paper as it is being lifted off. A piece of 3/16in. metal 1in. wide is fitted snugly across the top of the box and down two sides, with the ends bent out at right angles to act as handles. A piece of metal about 2½in. wide is riveted across the top section, and on each side a piece of metal is fastened by pivots to act as a spring arm. The two spring arms have a flat piece of spring metal between them and the main arm to hold them in the desired position.

The first step in preparing the paper for the bucket is to place the metal over the box. The paper is then laid over the metal and the edges folded down and held by the small spring arms. The metal piece is slipped off the box and lowered into the bucket and the spring arms released. By this method papering of the buckets is done quickly and neatly without creasing the paper. As the buckets are filled they are taken to the packing shed, where the weights are checked in readiness for packing. Two buckets are then placed in a wooden box with a hinged lid. The picking bucket illustrated was made from cutting a petrol tin down to a height of 7in. The wooden case also illustrated holds two buckets and has a hinged lid. The inside measurements are 8½in. deep x 9½in. wide x 19in. long.

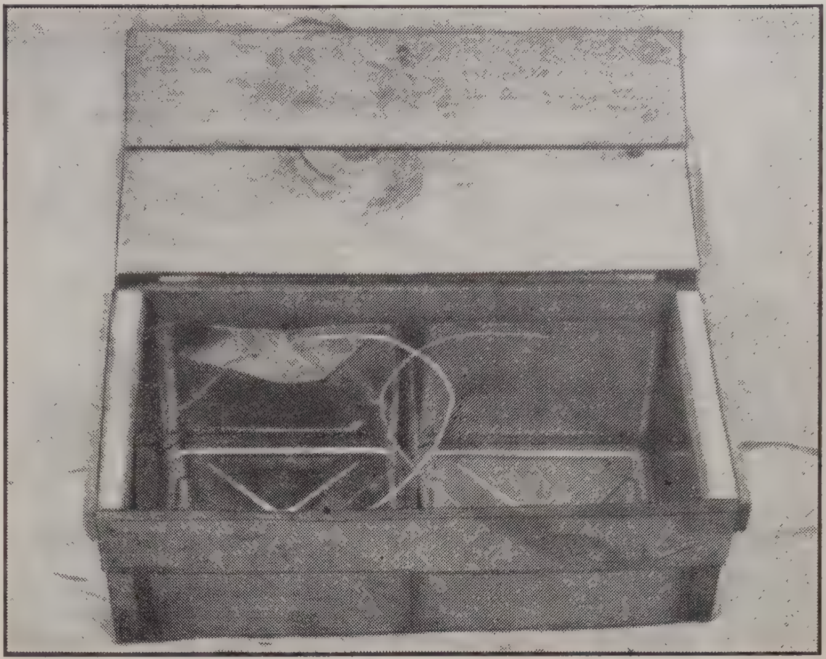


Fig. 12—A wooden case used for marketing loganberries. It holds two fruit buckets and has a hinged lid.

The pickers must take care not to step on or damage the young canes, as any damage to them reduces the next season's crop. To keep the young canes out of the way some growers peg them along the ground beneath the bearing canes, with stakes about 18in. long or with wire hoops similar to croquet hoops. The danger of damage from pickers is, of course, avoided if a system of tying in the new canes to a wire as they grow is followed.

By picking the fruit with two fingers and the thumb the pressure is more evenly distributed than if picked with only one finger and the thumb, and less bruising is likely to occur. As far as possible all fruit picked and packed should be at the same degree of ripeness. Fully or over-ripe fruit should be excluded from packages to be sent to distant markets, and berries which are sticky with juice, damaged by caterpillar, undersized, or malformed should be discarded, because they lower the value of the samples, which should also be free from leaves or other debris.

Yield and Life

A good plantation in full production should average about 2½ tons of fruit an acre annually, and up to 4 tons an acre have been secured in some seasons. The life of the plantation depends largely on the type of soil in which it is grown and on the treatment it receives in the way of cultivation, disease control, and manurial programme. Given favourable treatment in a suitable locality, the canes should last for 20 years.

Spraying

Loganberries are subject to most of the diseases that attack raspberries, and therefore the spray programme for both these fruits is practically the same. Insufficient detailed experimental work on loganberry diseases and pests has, however, so far been done to enable precise recommendations to be made. The essential points to remember in spraying are:

1. Using the correct amounts of materials.
2. Obtaining good coverage.
3. Applying sprays at the correct time.
4. A spray applied through a small orifice at good pressure gives better disease control than that applied through a large orifice at low pressure.

The spray outfit should be overhauled during the winter and all worn parts replaced or repaired. A breakdown, especially in the early part of the season, may allow disease to reduce considerably the yield of fruit.

Further details regarding the recognition and control of common diseases and pests are given in Bulletin No. 258, "Raspberries," which is obtainable free of charge from any office of the Department of Agriculture or information may be obtained from the Department's Orchard Instructor in your district.

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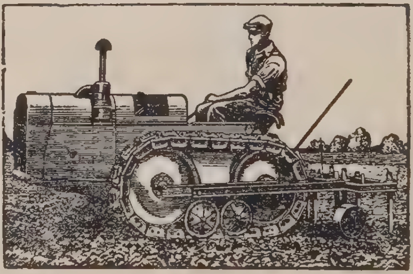

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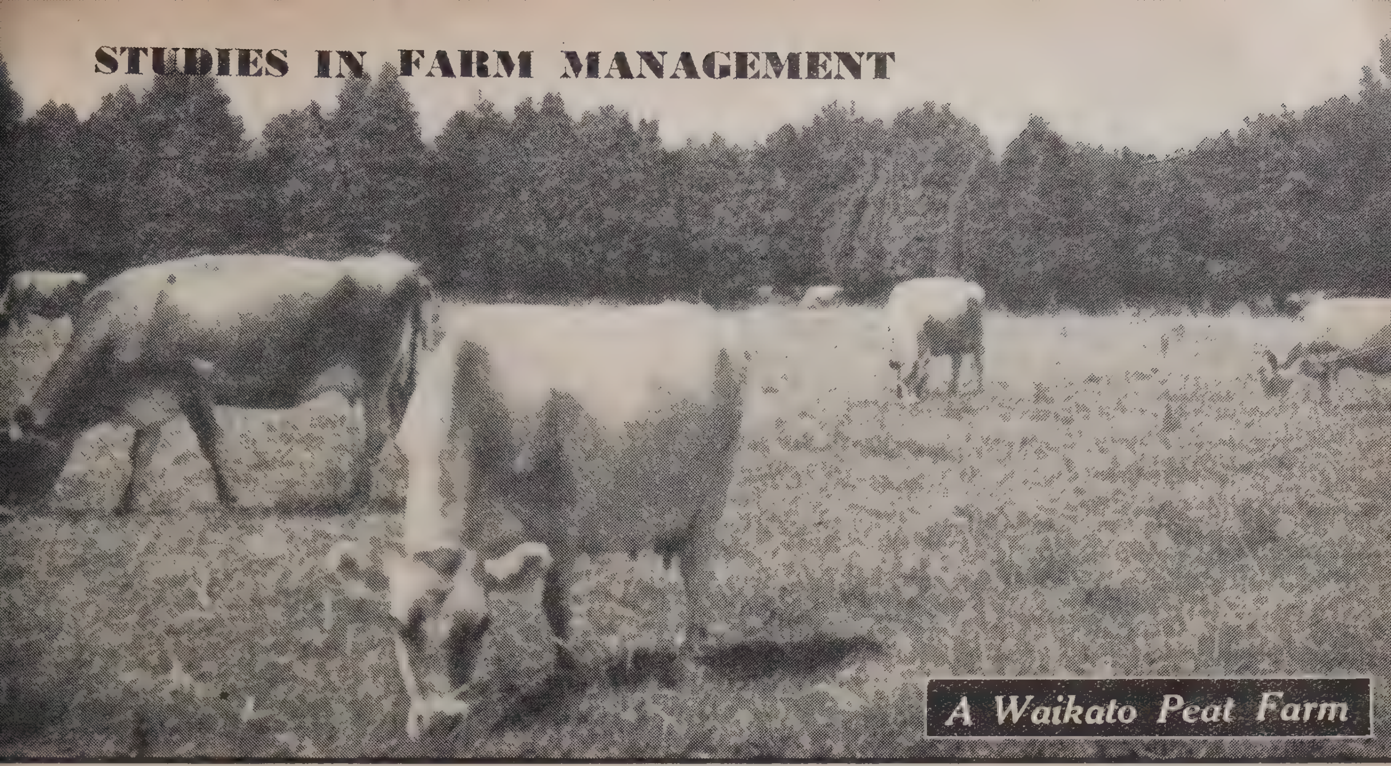
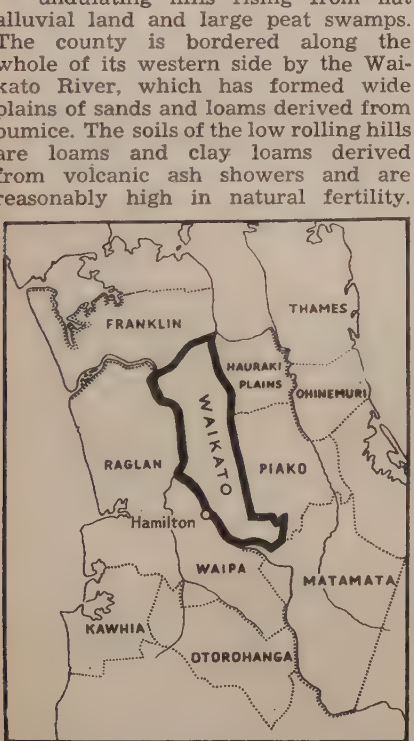


A Waikato Peat Farm

DAIRY farming on Waikato reclaimed peat swamp has numerous hazards. Difficulties of drainage, pasture establishment, subsequent management, stock health, and uncontrollable fires in the summer have to be overcome by the peat farmer. This article describes a typical Waikato peat farm which has been developed from unproductive land to a holding which now provides a living for five families.

By G. L. BANFIELD, *Assistant Instructor in Agriculture, Hamilton.*

THE Waikato County consists of low undulating hills rising from flat alluvial land and large peat swamps. The county is bordered along the whole of its western side by the Waikato River, which has formed wide plains of sands and loams derived from pumice. The soils of the low rolling hills are loams and clay loams derived from volcanic ash showers and are reasonably high in natural fertility.



The peat areas, occupying between 40,000 and 50,000 acres in the Waikato Basin, form quite a considerable portion of the Waikato County. Despite this large area of almost unproductive flat land, more dairy cows are milked in the county than in any other in New Zealand, with the exception of Franklin and Piako Counties.

STATISTICAL DATA, WAIKATO COUNTY *

Total occupied area (acres) ..	312,180
Number of holdings	1,677
Average area of holdings (acres)	186
Number of horses	4,536
Number of cattle	128,384
Number of dairy cows in milk ..	72,663
Number of pigs	28,366
Number of sows, 1 year & over	3,921
Number of sheep shorn	203,101
Number of lambs shorn	31,897
Number of lambs tailed	158,165
Grasses, clovers cut for hay (acs.)	20,833
Grasses, clovers cut for silage (acs.)	2,505
Lucerne cut for hay, silage (acs.)	174

* A. and P. Statistics, 1943-44.

The rainfall distribution throughout the area is relatively uniform (although it is higher toward the west), and it is also fairly uniform throughout the year, an important factor from the dairy farmers' point of view. The annual rainfall ranges between 45 and 61in., the wettest period being from May to July inclusive. After July the rainfall declines, but increases again to some extent in October. The dry season is from December to March.

The prevailing winds are south-westerly and may be very cold at times. There are also occasional strong winds from the north-east. There is a possibility of frosts in almost any month, although they are very rare from December to February.

The first part of the county to be developed was the easier country bordering the Waikato River, and the more fertile portions of the plains south of Taupiri. The country to the north of Taupiri is mainly hilly, but there is little which can be described as steep and the greater portion of it is ploughable. Development in that part was much slower owing to poor roading and did not go ahead until after 1930, when roads were improved by unemployment projects.

Missionaries introduced European farming methods in the Waikato about 1840, the period from about 1845 to 1860 being one of peaceful progress among the Waikato tribes. As a result of the Maoris' disinclination to sell their land to Europeans in the Waikato and disputes over land purchases in Taranaki there was severe fighting in 1864. After the defeat of the Maoris the Government confiscated the land of the rebellious Natives and settled the country with disbanded military settlers, each of whom received a grant of one town acre and a farm section of 50 acres or more according to rank. These settlers carried out mixed farming, producing wheat and potatoes for markets further afield.

The use of refrigeration, which developed an overseas market, and the application of centrifugal force to the separation of cream resulted in dairying, which had been developed as a sideline to mixed farming, becoming

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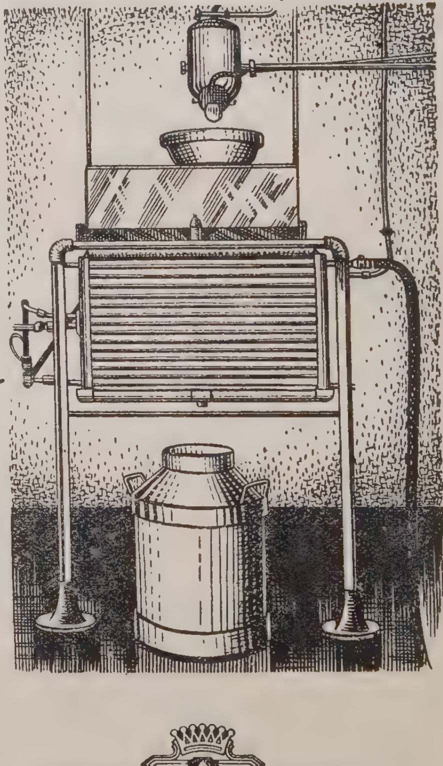

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a separate enterprise. Permanent grassland took the place of short-rotation pastures and the practice of intensive grassland farming was slowly developed.

It was in the Waikato that the practice of topdressing first started. Before this pastures rapidly deteriorated and had to be ploughed up. Cereal and fodder crops were taken before sowing back into grass again. At present most of the grassland is topdressed annually.

Dairying and fat lamb raising are the chief farming industries of the county. For winter and summer supplementary feeding of stock hay and silage are provided and swedes and turnips are grown.

Notwithstanding the progress the county has made, there are still large areas of flat, drained and semi-drained peat land, which, being unproductive, is the problem soil of the Waikato.

Formation of Peat Soils

In the past many different courses were followed by the Waikato River. These courses are marked by long ridges of sand and gravel, which in many places formed barriers across the mouths of subsidiary valleys, damming back the streams and forming lakes and swamps. Some of the former courses of the Waikato during this fan-building stage are clearly shown on the soil map of the Waikato Basin on this page.

Most of the peat swamps have been formed from the accumulation of peat on poorly-drained flats and not from the filling in of a lake as the present appearance in many cases suggests. The peat has been formed from the partial decomposition of coarse, reed-like vegetation such as rushes and raupo with spagnum moss often intermingled.

As a result of the waterlogged conditions bacteria which are responsible for the more complete decomposition of the vegetable matter are unable to exist and the peaty material therefore goes on accumulating. Around the edges, where there is a certain amount of run-off of aerated water into the swamp, conditions are more suitable for bacterial activity and the peat formation is very much slower. This has resulted in most of the peat swamps being somewhat dome-shaped in cross-section.

The swamps are largely unoccupied and unimproved, but on their margins, where the peat is shallow, considerable areas have been developed. The soils are light and dry out badly in summer, the effect of over-draining being to over-dry the soil so that it does not readily re-wet.

Around the margins of the peat bogs semi-swamp forests formerly flourished, kahikatea being the dominant species. These forests have formed stump belts up to 60 chains wide. In some places two or three layers of stumps show the advance of the bog to have been irregular.

Buried stumps and logs add additional hazards to the development of the marginal soils. Drainage and consolidation bring the stumps to the surface, and if the peat is then burnt, the burning is uneven and huge holes are formed which fill with water in winter. Where drainage or partial drainage has taken place the natural cover changes from rushes and moss to manuka and bracken fern.

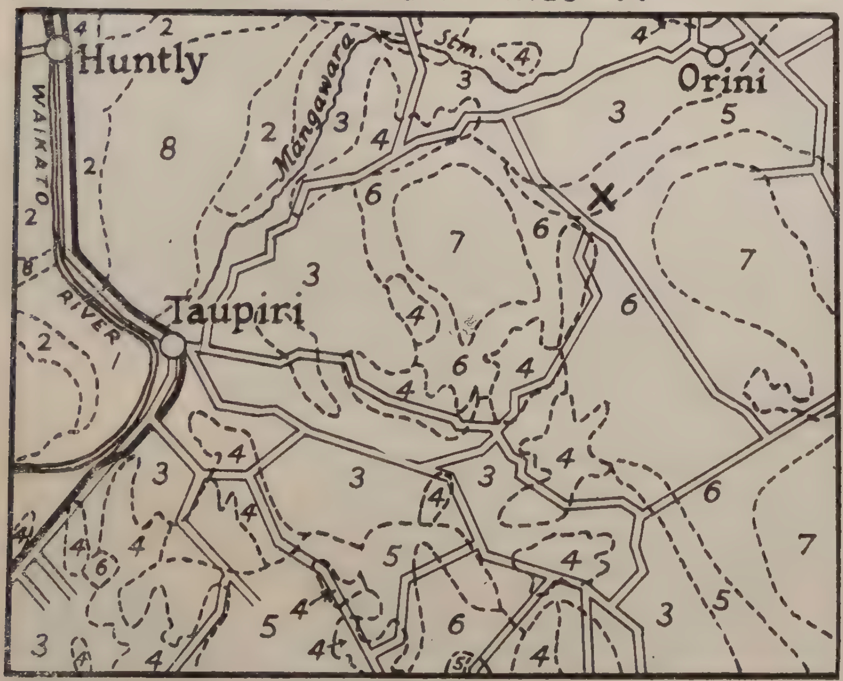
It is generally assumed that the finer the soil particles the greater is the upward movement of water in soils. Unless well consolidated, peat soils do not retain soil moisture, for the particles are too widely spaced, and it is not until they have been packed together and consolidated that the transfer of water from below to the surface soil is possible.

Peat soils in the Waikato are very deficient in mineral matter. Tests usually reveal a low potash content, and field trials have confirmed this. Phosphate may be present as an organic phosphorus compound, but it is not as available as mineral phosphates. Generally the peats respond to phosphate, potash, and lime. Work carried out by the Animal Research Division has revealed a definite copper deficiency in the peat areas. Lack of copper is the cause of an ailment in stock commonly known as "peat scours." The application of 5lb. of copper sulphate an acre with a spreading agent or a dressing of copperised superphosphate is sufficient to overcome the trouble.

Importance of Drainage

A tendency in the past has been to overdo drainage in the early stages of development. Consolidation must go hand in hand with drainage, and unless this aspect is closely watched, success will not follow. Large-scale methods have been tried and found successful in breaking in peat soil overseas. In Europe about 2in. of soil has been spread over the surface of the peat, and in the U.S.A. the provision of a high-level water supply has enabled the drains to be kept full in summer, preventing the peat from drying out.

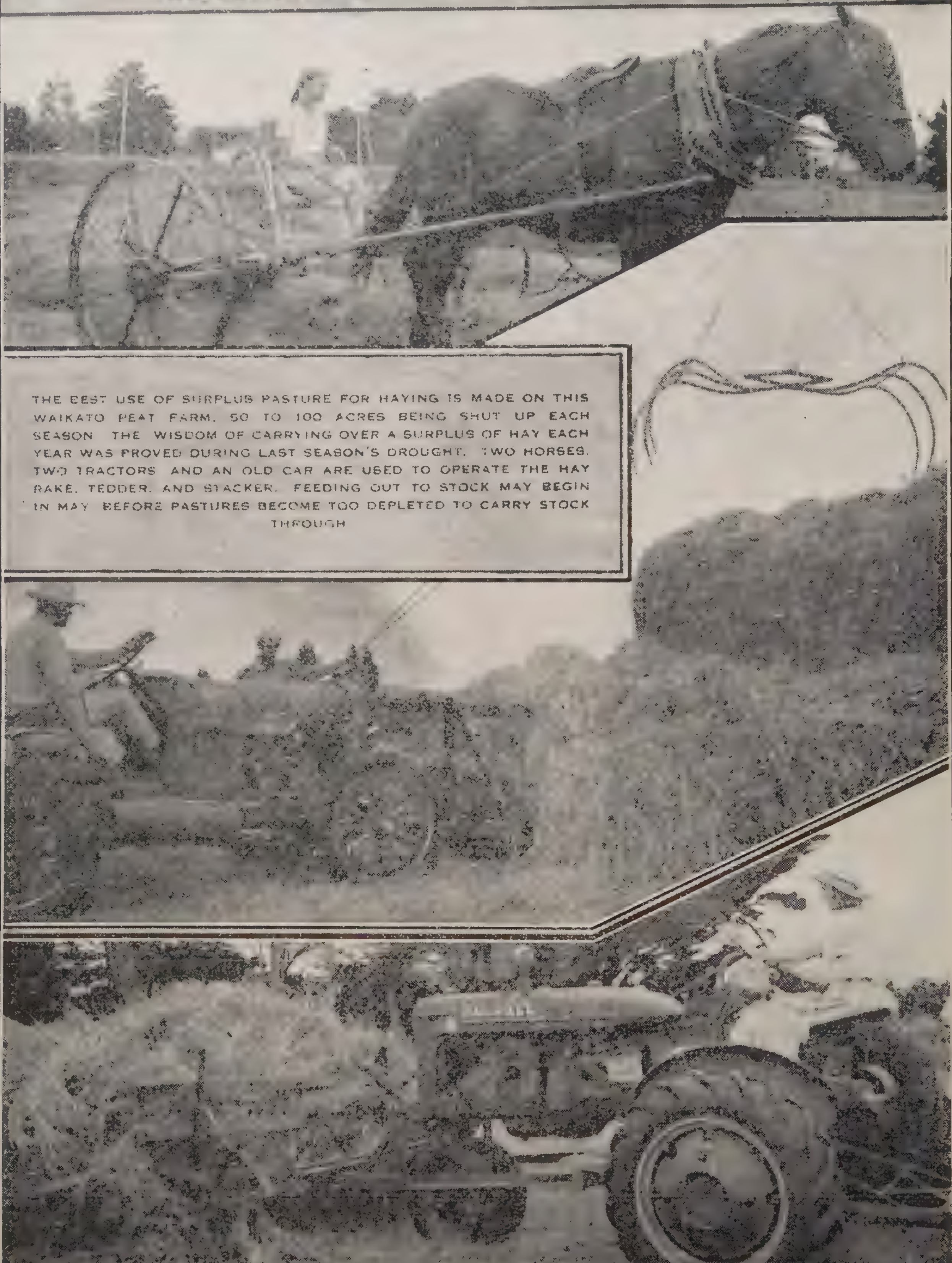
Location of Farm thus **X**



LEGEND

1—Recent alluvial deposit.
2—Secondary podzol. Later semi-mature. Hill soil. Shattered greywacke.
3—Immature yellow-brown loam from rhyolite alluvium.
4—Brown granular clay from volcanic ash (Hamilton clay loam).
5—Meadow soil, poorer drained. Pumiceous sands and peat.
6—Intermediate peaty loam and loamy peat.
7—Acid peat (Rukuhia peat).
8—Steep, skeletal hill soil. Clay loam and stony clay.

HAYMAKING ON A WAIKATO PEAT FARM



THE BEST USE OF SURPLUS PASTURE FOR HAYING IS MADE ON THIS WAIKATO PEAT FARM, 50 TO 100 ACRES BEING SHUT UP EACH SEASON. THE WISDOM OF CARRYING OVER A SURPLUS OF HAY EACH YEAR WAS PROVED DURING LAST SEASON'S DROUGHT. TWO HORSES, TWO TRACTORS, AND AN OLD CAR ARE USED TO OPERATE THE HAY RAKE, TEDDER, AND STACKER. FEEDING OUT TO STOCK MAY BEGIN IN MAY BEFORE PASTURES BECOME TOO DEPLETED TO CARRY STOCK THROUGH.

Control of drainage water is most important and most difficult to obtain. Nevertheless, attempts to hold water in the drains by blocking methods or by the use of a flood-gate system will assist to reduce the risk of letting the water-table fall too far in prolonged dry weather. The drains must be progressively deepened as consolidation takes place.

A low water supply in a dry season is not only very detrimental to good pasture establishment and growth, but is dangerous as a fire risk. The uncontrollable summer fires do a great deal of harm. As the peat is dry to a considerable depth, the fires burn deeply, leaving an uneven surface often with great holes. Established pastures burnt off in this manner mean the waste of years of slow consolidation and pasture improvement (see illustration below). To obtain best moisture conditions the ground water should be kept at about 18in. below the surface.

Present-day methods of developing peat land consist of first crushing the manuka with a heavy roller or giant discs drawn by a crawler tractor. The manuka is burnt off and a grass seed mixture sown as soon as the ash is cool.

Effect of Ploughing

A better method is to plough the peat after burning off the manuka and then to burn the furrow slices as soon as they are dry and while the underlying peat is still wet. This type of burning gives a thin, even ash layer, ideal for the establishment of grass and clover. The effect of burning the peat is to concentrate in the ash saline matter, more particularly the alkaline carbonates, thus helping to correct the two great faults of the remaining peat—its deficiency in mineral matter and its sour reaction. At the same time weeds and other coarse vegetation on the surface are destroyed and a clean seed-bed obtained. Pasture establishment should not be attempted on deep, raw peat except after a burn.

The great tendency of peat to dry out in the summer prevents the growth of shallow-rooting plants, and until such time as consolidation has taken place to allow of water conduction from below it is useless to sow the ordinary pasture plants. A plant with a deep rooting system is essential for initial work and *Lotus major* is unequalled, as it has demonstrated its ability to establish and to persist on the raw, unconsolidated peat swamps. It provides sufficient feed to attract stock and the resultant treading brings about a certain amount of consolidation.

Yorkshire fog and browntop, besides being able to tolerate extremely wet conditions, possess certain drought-resistant characteristics which enable them to endure the extremely dry summer conditions common to peat swamps. These characteristics place these grasses foremost as pioneer grasses for swamp reclamation. Paspalum, because of its deep rooting system and its ability to withstand dry periods, is also a valuable species to include in a pioneer grass seed mixture.

The value of feeding out hay on areas in the process of development cannot be over-emphasised, because gradual seeding takes place from the hay and consolidation is brought about.

Peat development is costly, and ultimate success requires patience and finance. The draining of these large peat areas is, in the opinion of the writer, a national problem, as it is usually beyond the scope of the individual farmer.

Established pasture wasted as a result of uncontrolled summer fires.

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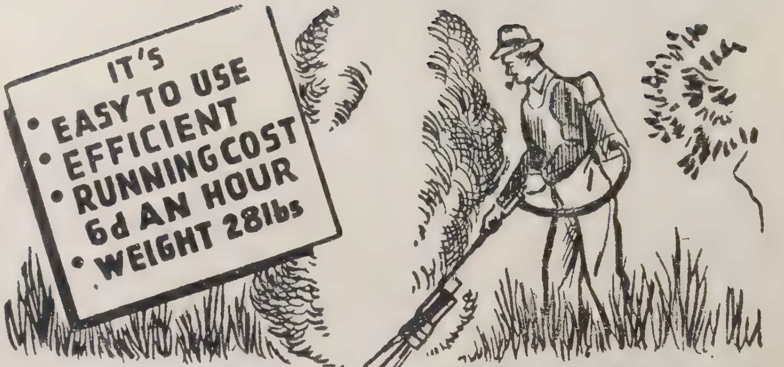

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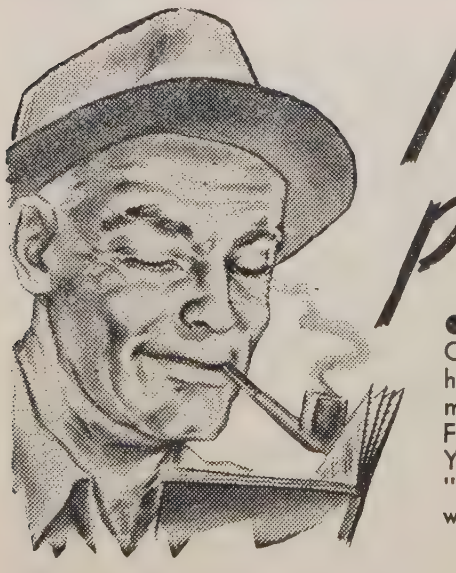

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DEVELOPING A WAIKATO PEAT FARM

Burning off manuka after crushing.

A WAIKATO PEAT FARM

Mr. F. R. Catly, who originally came from Marlborough, had considerable experience at all types of farm work. Starting in 1908 with less than £600, he took over the property of 360 acres for which he paid £3 17s. 6d. an acre. The farm is on the Tenfoot Road, 7 miles from Taupiri, which is 15 miles from Hamilton. The whole area was in high manuka, except for a few patches which carried browntop, danthonia, and flat weeds. The depth of the peat varied from 4 to 20ft., the deepest portion being toward the back of the farm. The property was completely undrained, although a drain locally known as the Tenfoot Drain ran along a road fronting the farm.

Five years after taking over the property a homestead was built to replace the shack he had been living in. This was erected on the only dry piece of ground available at the time. At one stage Mr. Catly was forced to sell 80 acres of the property in order to carry on the remainder, but this has since been bought back. Today the farm, freehold and producing 140lb. of butterfat an acre, is valued at £30 to £40 an acre.

About 8 to 10 years ago Mr. Catly's two sons, who contributed a share in the development of the property, took over a portion of the farm each. The two portions are worked now as entirely separate units.

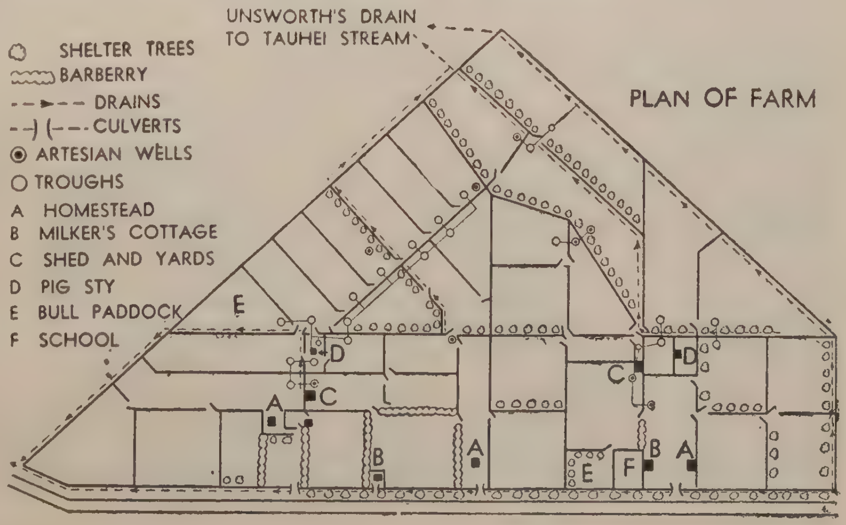
Although Mr. Catly, sen., has now retired from farming, he still resides on the property, taking an active interest, and sometimes a very active part, in the work of the farm.

Because drainage has been his greatest problem in the development of the land, Mr. Catly now believes it to be his strongest point. The first drains put in ran into the Tenfoot Drain. The fall of the land was toward this and the system employed at that time was simply to dig drains where the water lay deepest on the surface. Open drains were used and were dug as deeply as possible and about 2ft. wide at the bottom. They required very little care other than being deepened as the peat consolidated. In the early stages of development considerable losses resulted from cattle getting bogged in the drains.

After some consolidation had taken place the level of the peat on the farm sank to such an extent that it was well below the level of the surrounding country. This resulted in water draining in from all sides, even from the Tenfoot Drain when in flood. An attempt to form a drainage board in 1911 was unsuccessful, so Mr. Catly was forced to take immediate action or walk off the property.

Fortunately he obtained permission to deepen a drain going through a neighbour's property which opened into the Tauhei Stream. He considers that that outlet saved the property, for without it he could never have carried on. As the drain was situated in the lowest clay level of the property, it gave an outlet for the whole farm.

After the First World War there was more general development of the land surrounding the farm and a drainage board was formed. The swamp sank gradually and this in turn helped to drain the property.



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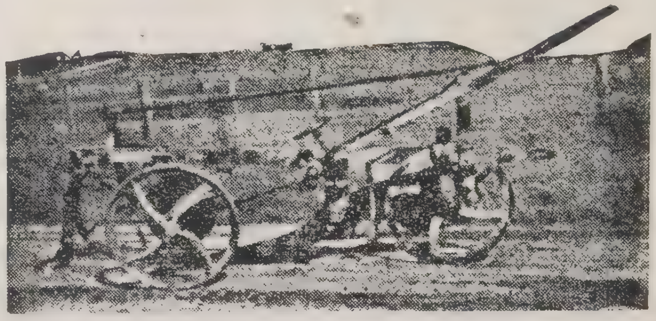

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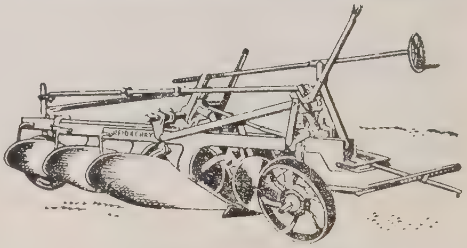

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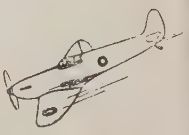

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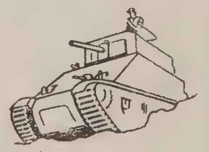

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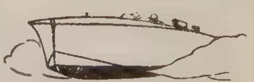

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The deepening of the neighbouring drain, which is known as Unsworth's drain, was so effective that practically no draining was required in the front paddocks and at the present time there are no large drains in more than 200 acres of the farm. It is interesting to note that the property originally sloped into the Tenfoot, but the fall is now toward the back of the farm where the peat was deepest. All openings into the Tenfoot have been completely closed off.

In 1923 and 1924 the Government carried out a comprehensive survey to determine the clay levels of the whole area. Since then some drains had been put in correctly, but Mr. Catly thinks that many have been put in haphazardly and not in accordance with the underlying clay levels. As the peat consolidated the incorrectly-laid drains were left high and dry on the ridges.

Contrary to the accepted theories of peat development, Mr. Catly does not believe in controlled drainage, but aims at complete and quick draining and, where possible, getting his drains down on to the clay or sand. He maintains that it is not possible to have 18in. to 2ft. of drained peat on top of wet peat, as water cannot be consolidated. If possible, the best policy is to burn off the peat after draining. The object is to get down to the hard land as quickly as possible, and if complete drainage cannot be obtained on an area of land, the land is not worth taking up.

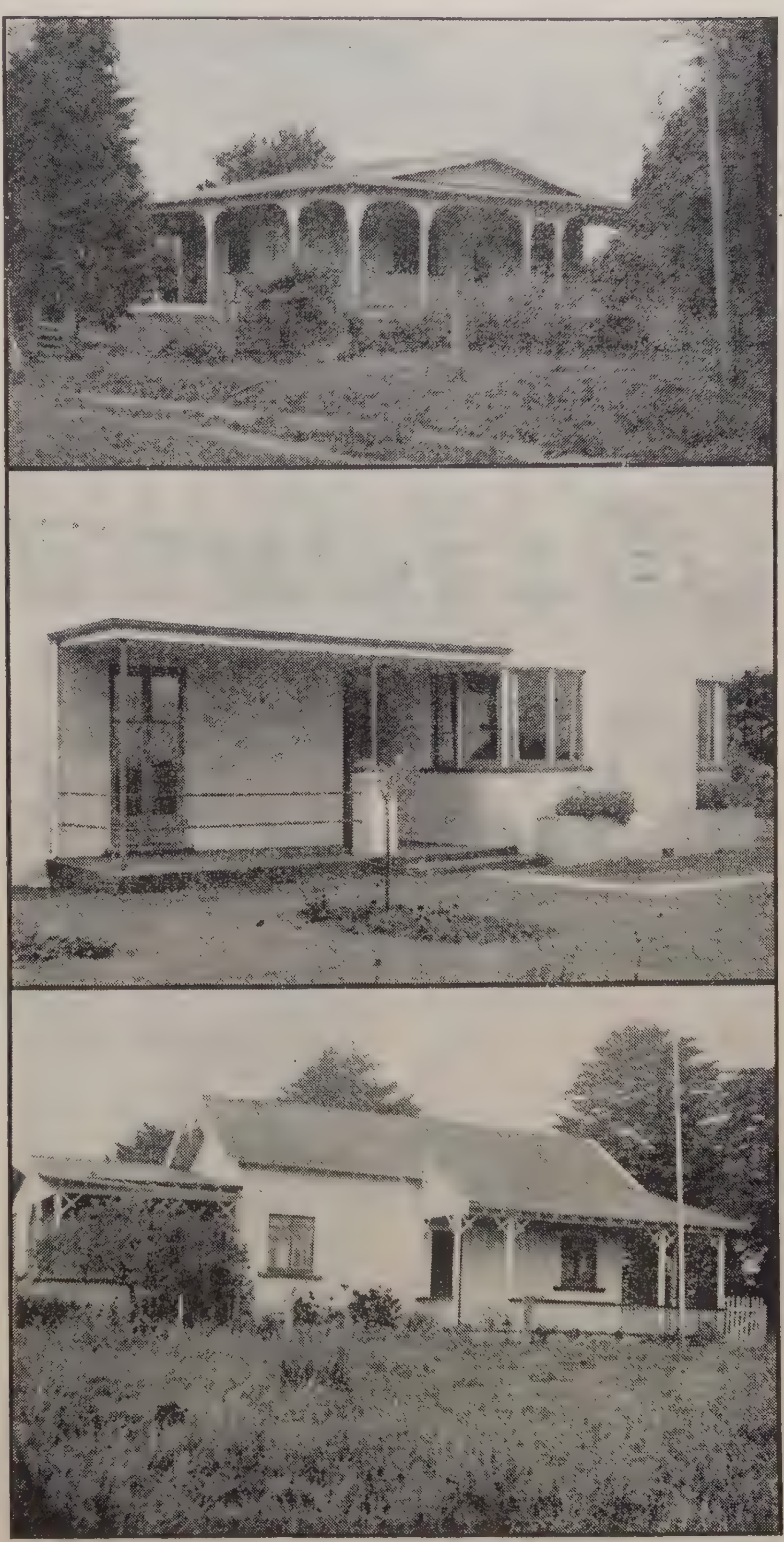
Pasture Establishment

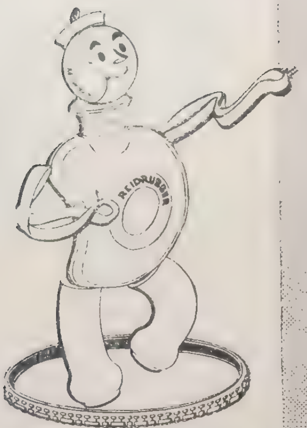
After carrying out a certain amount of drainage Mr. Catly then had to establish some kind of pasture. The manuka was cut with a slasher, a laborious method compared with the modern practice of crushing with a heavy roller. The manuka was burnt as soon as it was dry and the peat was ploughed about the end of November or the beginning of December, the furrow slice being burnt off as soon as the dry weather came, from January onward. This ensured an even burn without the formation of holes. A discing followed to mix some of the soil at the bottom of the furrow with the ash. After a harrowing the following grass seed mixture was hand sown in March:—

	lb. per acre
Perennial ryegrass ..	20
Cocksfoot	8
Timothy	½
Red clover	3
White clover ..	1
Lotus major	½
Total	33

A light brush harrowing completed the operation. Providing the drainage was adequate and topdressings were applied, a good pasture was obtained in four to five years.

THE THREE HOMESTEADS





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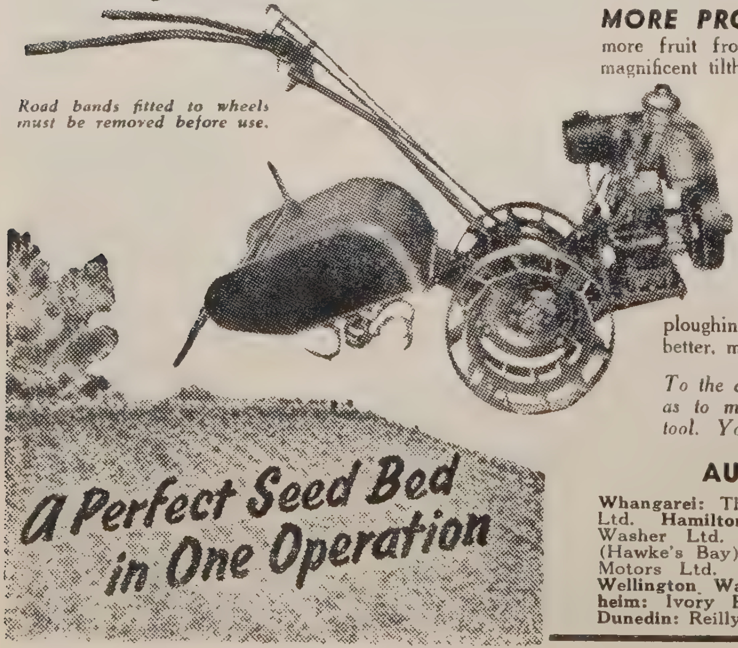

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Before and after crushing and burning of manuka, followed by sowing of pioneer grass mixture on ash.

Another method adopted was cutting and burning the manuka, stumping if necessary, and ploughing. This was followed by the usual cultivation and the area was then sown in swedes. The swede crop was followed by a turnip crop fed off in time for autumn sowing of pasture. The trampling of stock feeding off these crops caused some consolidation before the sowing of grass. It is important, however, that preparatory cultivation for the grass after turnips consist of only a light discing to avoid bringing the raw peat to the surface again.

Stumping

Mr. Catly has found gelignite the most satisfactory means of removing stumps. The overburden is first removed to facilitate the placing of the charge, which must be put well down under the stump. The job is best done when there is moisture present, as this provides a more solid resistance to the explosive than the dry peat. To place the charge a hole is made with a crowbar or 1in. pipe and up to 12 plugs of gelignite are inserted into the hole. Experience has shown that it is better to use a big charge than to have to make a second attempt. The displaced stumps are heaped up by horses or tractor and burnt when dry.

Pasture Management

Rotational grazing has been carried out on the farm, which is well subdivided for the purpose. During the winter all the stock are kept together on one paddock and are fed hay. When one paddock is cleaned up they are shifted on to the next and, as soon as the cows are taken off, the area is harrowed and closed up for early spring feed. Paddocks may be closed up in this way from the middle of May onward, depending on the season. About three-quarters of the farm would come under this treatment during the winter. Severe harrowing, which has been found on the farm to favour weed development, is not carried out, the harrowing being just sufficient to spread the manure.

Pastures are topped where and when considered necessary, the intention being to prevent weeds from seeding and to control pastures which may get away.

From about 1934 a great deal of trouble was experienced with "peat scours," the yearlings particularly being affected. Cobaltised superphosphate brought about an improvement, but did not cure the complaint. Since the discovery that a copper deficiency is the cause copperised serpentine superphosphate has been used in place of the cobaltised superphosphate.

A rotary topdresser fitted to the back of a trailer capable of holding one ton of manure is used for spreading the fertiliser, this type being preferred because of its speed and ability to topdress fence lines. On the flat peat land topdressing can be carried out with a converted Dodge car at up to 15 miles an hour.

Although a few backward pastures are sometimes topdressed in the spring, most of the farm is treated in the autumn. If topdressing is discontinued for a time, there is a quick reversion to browntop and Yorkshire fog. Lime is applied at the rate of 4cwt. an acre every second year, but the peat does not seem as responsive to lime as hard land.

Cropping

Owing to the uneven consolidation of the peat, pastures tend to become very uneven after they have been down a number of years. Ploughing-up then becomes necessary and at that time opportunity is taken to grow a crop of swedes. Sowing takes place toward the end of November and to ensure a strike it is essential to sow after rain. As the top 2in. or so of the peat dries out quickly when the drier weather comes, it is very important not to sow later than November to ensure that the crop is sufficiently advanced to send its roots down to moisture. Once the swedes are at the three-leaf stage the crop is safe. Mr. Catly favours Crimson King or Superlative and usually sows at the rate of 1lb. of seed an acre. This abnormally-high rate of seeding is to compensate for the relatively small roots produced on the peat.

Pasture being established on ash after ploughing and burning off.

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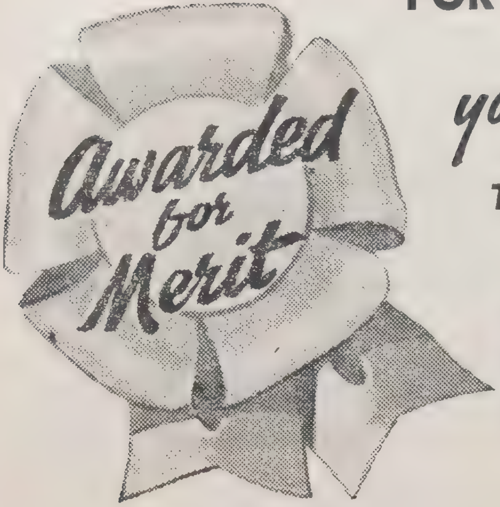

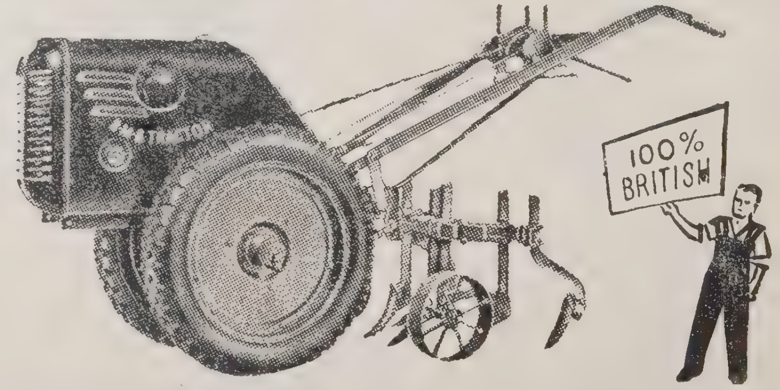

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Thin layer of ash overlying wet peat.

The swedes are usually not touched until the beginning of August, when they are fed off in breaks by use of the electric fence. They can be fed off in all weathers without fear of poaching.

The swede crop, of which there is generally an area of about 16 to 18 acres, is followed in the second season by Imperial Green Globe turnips, and these are used for the cows from the end of January until March. Sowing of the turnips generally takes place from the middle to the end of October; if they are sown before then, willow weeds tend to get the upper hand.

Cultivation for swedes consists of a deep ploughing, a double discing, and, finally, two strokes of the harrows, but for the turnips ploughing is not necessary. Wherever possible surface cultivation is preferable to deep ploughing, which spoils the consolidation and brings the raw peat to the surface. The ground is rolled before and after sowing. Swedes and turnips are the only crops now grown, as experience has proved that these are the most satisfactory on the peat.

In the past rape was grown for fattening lambs, but it was found that it was unsatisfactory owing to the difficulty with which it matures in the climate. Maize was also tried, but was too uncertain to be of value because of late frosts. Oats have proved fairly satisfactory when grown for chaff, but when grown for greenfeed the results were poor. The plants do not seem to stool out as they should and very little second growth is obtained. This condition is one of the symptoms of copper deficiency.

Results with chou moellier have not been pleasing. Little bulk is produced in the stems, which grow tall with little leaf. In addition, the fibre content of the stems appears to be unusually high. Field peas have been tried, but wet conditions and weeds, of which red shank and willow weeds are the worst, have made this also a risky crop.

Dairy Herd

Until 1941 only one herd was milked on the farm, a considerable proportion of sheep being carried. The sheep have now been dispensed with and a second dairy herd is being built up gradually. With the farm now operating as two separate units, a total of 200 cows are milked at present, and in the season before last year's drought they produced 49,000lb. of butterfat.

Nearly all replacements are bred on the farm, only the early calves being kept. Pedigree bulls are used at the beginning of the season and scrub bulls are used for the late cows, whose calves are not kept. As a result of this system there are sometimes insufficient heifer calves and replacements have to be bought in. The replacements for one herd are reared on the farm and those for the other herd are grazed on a section owned by one of the sons about three miles from the Catly farm.

Twenty calves are reared each year on one farm and 30 on the other. They receive full milk for the first fortnight before going on to skim-milk supplemented with calf meal. At five months the calves are gradually weaned on to good pasture.

Pig Production

At the time that "peat scours" became evident in the young dairy stock trouble also started in the pigs. The affected pigs became paralysed, more particularly in the hindquarters. Although a copper deficiency was known to cause this condition in lambs, it was not known to produce it in pigs. The trouble cleared after the change was made to copperised serpentine superphosphate. It is possible, of course, that the outbreak and subsidence of the paralysis in the pigs were merely coincidental with the changes in the fertilisers, as paralysis in pigs from a variety of causes is common all over New Zealand and does not occur only on peat.

The Catlys are now building up the pig section of their farm and before long pigs should provide their proper share in the farm revenue. However, expansion in pig production has been held up by the shortage of building materials, but one fattening house of eight pens is completed and another of 12 pens is half completed.

The pigs are run as two units, one to each milking herd. Tamworth boars are used with Berkshire sows, and pigs from these matings produce good-type baconers. All pigs are taken to bacon weight and sold by weight to the Co-operative Pig Marketing Association. They are mainly run out on pasture, but are styed for fattening.

Feeding consists almost entirely of skim-milk, a little meat meal being fed only to the little pigs. Some maize may be bought when milk is short. Any unfinished pigs in the autumn are turned out on to pasture and swedes.

Hay

All surplus pasture is made into hay, from 50 to 100 acres being shut up for this purpose each season. Silage is made only if the swede crops fail, although it is expected that more of this will be made in future when the

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SHOW DATES

THE following are dates and venues of A. and P. shows in May and June:—

May 30, May 31, June 2, June 3, June 4—Otago A. and P. Society's Winter Show at Dunedin.

June 20, June 21—Rotorua A. and P. Association's Winter Show.

Good Lawsoniana hedges are a feature of the farm. A swede crop is thriving in the shelter of this one.

need for ploughing up unevenly-consolidated paddocks has been reduced. Silage is not favoured, however, because of the heavier and larger amount of work it entails. Feeding out commences early, before the pastures become too depleted to carry the stock right through, and may be started from the beginning of May onward. A surplus of hay has always been carried over, and the value of this was plain during last season's drought.

Shelter

Lawsoniana does well on the consolidated peat and forms the greater part of the shelter hedges on the farm. It is difficult to fence adequately owing to the ease with which stock can push over posts in the peat. The remedy is to place the fence further out from the hedge than would be required on hard land. Barberry, which forms the remainder of the hedge shelter on the farm, also does well, but requires to be fenced in the early stages of growth to prevent stock from pulling the cuttings out of the peat.

A few pines appear in odd corners of the farm, but are not considered satisfactory because of their tendency to blow over and the poor ground shelter they provide. These faults are caused by the shallow rooting systems produced in the peat.

Water Supply

Artesian water from bores in the vicinity of peat areas tends to be very "irony." The likely explanation of this is that the extreme acid condition of the peat throws the iron into solution. By sinking wells to depths greater than 200ft. it has been found that reasonable water can be obtained. A number of bores are distributed over the farm as shown in the accompanying plan, and a high-pressure pump system is fitted at each cowshed. The bores supply nearly all the paddocks, the exceptions being those watered by the Tenfoot Drain. The temperature of the artesian water is just two degrees lower than churning heat (62 degrees F.).

Power and Implements

Two horses are kept for working the hay rake, tedder, and stacker, and for carting out the hay. Two tractors, one 14 h.p. and the other 16 h.p., provide power for all other purposes. A converted Dodge car is used for sweeping and for pulling the trailer carrying the rotary topdresser. It is particularly suited for these jobs, as it is much faster than the tractor. There is also the usual range of cultivators and harvesting equipment used on the modern dairy farm.

Buildings

There are five houses on the property—one each for the two sons, two milkers' cottages, and the original homestead where Mr. Catly, sen., resides.

As the property is now worked as two seperate farms, most of the buildings are duplicated. The implement shed serves both farms and is also used as a manure shed and workshop. The cowshed on one unit is fitted with a 6-cow plant and the one on the other property is fitted with a 5-cow plant.

Acknowledgment

Thanks are expressed to the Lands and Survey Department for the drawing of maps used in this article.

Young Farmers' Clubs' National Memorial

TO commemorate the sacrifice made by its members who lost their lives overseas in the Second World War, the New Zealand Federation of Young Farmers' Clubs has inaugurated a national memorial scheme which has as its objective the erection of new buildings at Massey and Lincoln Agricultural Colleges to provide extra facilities for Y.F.C. short courses. The federation's intention is that the memorial will not be the buildings themselves but the agricultural education they will make available to young farmers in the future. A tablet inscribed with the names of young farmers who gave their lives will be placed in each building.

A target of £20,000 to be collected in two years has been set, and units of the federation are now engaged in raising funds by means of special activities and personal contribution.

Details of the progress of the scheme appear from time to time in the Young Farmers' Clubs "Supplement," which contains reports of Y.F.C. activities and articles and news of interest to young farmers. The "Supplement" is published monthly and is distributed with the "Journal of Agriculture" to all active members of Young Farmers' Clubs. Other subscribers to the "Journal" may obtain copies of the "Supplement," post free, on application to the Dominion Secretary, N.Z. Federation of Young Farmers' Clubs (Inc.), P.O. Box 3004, Wellington.

Pig Broadcasts

UNDER the auspices of District Pig Councils broadcasts will be delivered in May as follows:—

Auckland—1YA, on May 21, at 7.15 p.m., "Points to Remember in Planning Location of Farm Piggery," by A. F. Barwell, Supervisor, Bay of Plenty District Pig Council.

Wellington—2YA, on May 20, at 7.15 p.m., "The Meat Inspection Service," by I. H. Owtram, Supervisor, Taranaki District Pig Council.

Christchurch—3YA, on May 15, at 7.15 p.m., "Some Fallacies Regarding Pig Production," by H. McIntosh, Supervisor, Canterbury District Pig Council.

ACKNOWLEDGMENT

In the article "Studies in Farm Management: An Otorohanga Dairy Farm," which appeared in the February issue of the "Journal," no acknowledgment was made of the photographs accompanying the article. These should have been acknowledged to Desgranges Studios, Te Kuiti.

Treatment of Bark Diseases and Borer in Lemon Trees

By J. E. HUME, *Orchard Instructor, Tauranga.*

MANY lemon growers have discovered on careful inspection of their trees that bark troubles and borer have gained an extensive hold. Diseases such as bark blotch, collar rot, shell bark, and citrus borer probably account for more crop and tree losses in lemon orchards than other diseases with which the orchardist has to contend.

THE cover afforded by dense foliage and low, spreading branches frequently allows these troubles to gain a hold and increase their grip unnoticed by the grower. Not until the affected tree suddenly declines does the grower become aware that all is not well within his grove. Trees should be inspected frequently so that infection may be located and treated while it is still incipient. Trunks or limbs with a heavy deposit of dirt or moss adhering to them provide sufficient cover for such diseases to spread unnoticed by the casual observer, and close inspection is necessary to detect them.

Bark Blotch

A troublesome fungous disease commonly attacking the trunk and main limbs of lemon trees is bark blotch (*Ascochyta corticola*). The spread of this disease is fostered by damp, shaded conditions, often brought about by tall weed growth round the butts of trees or by mulching material piled against the butts, especially of trees with low-spreading branches.

The disease may be recognised in its early stages by light- to dark-brown patches with slightly-raised margins. Closer examination will reveal that the bark is dead, though still firmly attached to the wood. As the disease becomes established it may travel some distance up the branches before finally girdling a branch, which then dies. The bark falls away from old cankers, exposing the wood beneath.

Remedial measures include the removal of tall weed growth from round the trees and keeping mulch at least 6in. from the butts. Wounds and infected parts should be painted over with Restar fluid. From two to four applications at monthly intervals may be necessary to control bad infections. Restar may be used with safety at full strength on old and mature wood. Where cleaning of the butts is necessary before applying Restar high pressure hosing is a safe and convenient method. The use of a brush is likely to spread infection to sound tissue.

Collar Rot

Collar rot is another serious fungous disease which attacks not only the stem but the crown and upper portion of the roots of a citrus tree. It is usually associated with poor drainage and poor soil aeration or a bud union which has become covered by soil, heavy weed growth, or mulch.

Infection is usually followed by a yellowing of the foliage and a general unthrifty appearance of the tree. An examination of the butt will show a gummy exudate at or near the crown. The bark in the affected region becomes discoloured and rotten and may be removed by light pressure.

Prompt control measures are necessary, as this disease can be rapid and severe in action. Tall weed growth should be suppressed, mulching material kept back from the trunk, and attention given to drainage and soil aeration. The affected tissue should be carefully removed, the wound sterilised with acidulated mercuric chloride, 1 : 1000, and then sealed with a bituminous paint.

Shell Bark

A disease of less severity than bark blotch or collar rot is shell bark (*Diaporthe citri*). Lesions are more streaky, and except in cases of advanced infection the injury usually does not penetrate as deeply into the bark tissue as bark blotch.

Infections should be treated in the same manner as bark blotch and, if they have not become too deeply seated, the young bark will grow away again from under the damaged tissue. Precautionary measures in orchard practice recommended for the control of bark blotch apply also to this disease.

Citrus Borer

A pest which causes serious damage to young twigs as well as to the heavier wood is the citrus borer (*Aemonia hirth Fabr.*). These voracious tunnellers can devitalise a tree seriously if left uncontrolled.

Borer damage can be simply remedied in young twigs by the removal of the affected part and, at the same time, by locating and destroying the insect. When it gets into the heavier wood or main limbs or trunk its elimination offers greater difficulty. The presence of borer in the trunk is often associated with the bark troubles mentioned earlier, and is frequently the major cause of some of these bad infections developing rapidly and extensively. If the borer is observed in the early stage of its entry and destroyed then, many of the wounds will callous over and the life of the trees be preserved longer.

There are no short cuts to keeping the borer in check. Constant vigilance is required on the part of the grower in going over his trees, removing infected twigs, and locating tunnels in the heavier wood, into which petrol or a 50 per cent. solution of Restar should be forced, preferably with a pressure oilcan fitted with a flexible spout. When petrol is used the holes should be sealed with soap or heavy petroleum jelly to keep in the fumes.

Little stubby pieces of dead wood afford easy means of entry for these pests, and they should be cut back close to the bud when they are pruned.

Complete spray schedules for the control of citrus fruit diseases and pests in New Zealand are included in Bulletin No. 20, "Recognition and Control of Citrus Diseases in New Zealand," which is available free from offices of the Department of Agriculture.

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A HOME-MADE POTATO PLANTER

By C. J. CROSBIE, *Assistant Machinery Officer, Christchurch.*

A NOVEL potato planter designed and built by Mr. W. Smith, of Styx, Christchurch, from scrap materials is described in this article. Though it cost next to nothing to make, with this machine the owner was able to plant 12 acres of potatoes at the rate of nearly 1½ acres a day without employing labour.

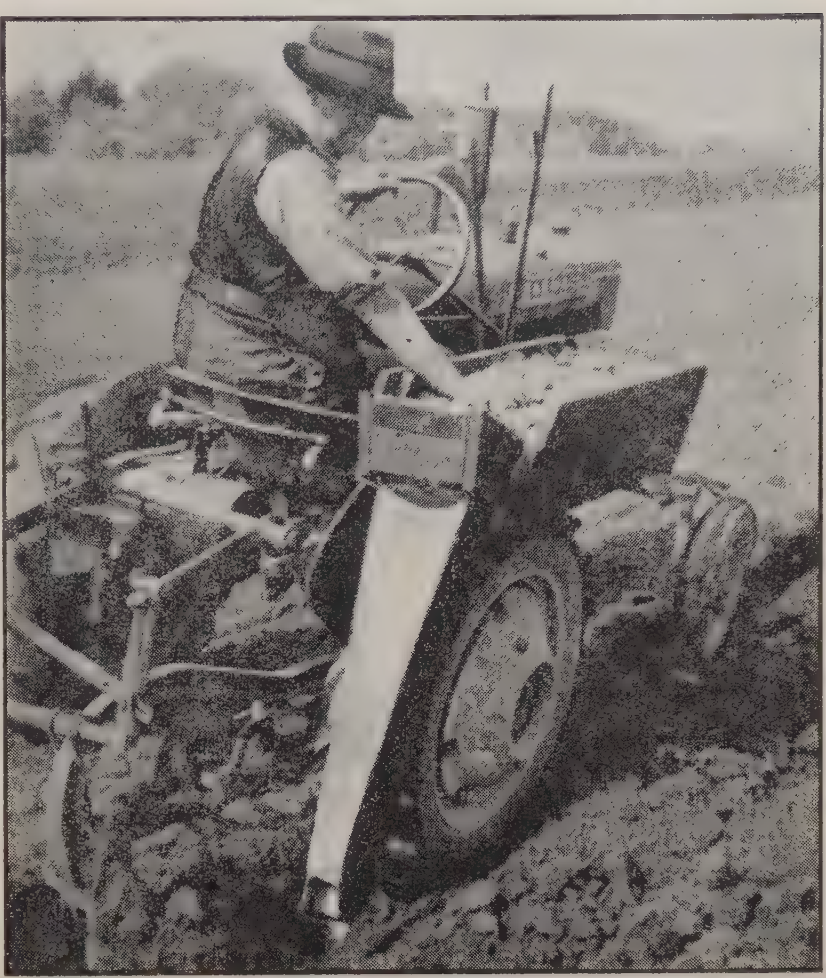


Fig. 2—The chute is inclined at an angle of 60 degrees to drop the potatoes just in front of the furrow being turned.

THE planter consists essentially of a box mounted on the mudguard of the tractor and a chute fitted behind the wheel to guide the potatoes into the furrow. It may be built on any tractor fitted with a single- or double-furrow integral plough. Mr. Smith made the box 3ft. long, 14in. wide, and 12in. deep, but it must be able to carry enough potatoes to plant two rows the full length of the field. Two lengths of iron standard bent at right angles were bolted to the outside of the mudguard and used as brackets to support the box, suitably-shaped pieces of wood being used as packing between the curved face of the mudguard and the brackets.

The chute was made by bending a sheet of galvanised iron into the shape illustrated and nailing it to a piece of 9in. by 1in. timber which had been tapered to 5in. at the bottom. About 4in. deep along its length, the chute has a wooden mouth made larger to guide the potatoes into it easily. It is attached to the rear of the box by one bolt so that it may be swivelled into the desired position, and has about 3in. clearance from the ground.

The rear end of the box has a slope of about 60 degrees to bring the mouth of the chute forward to within easy reach of the operator. This end of the box needs to be firmly constructed, as it carries the weight of the chute.

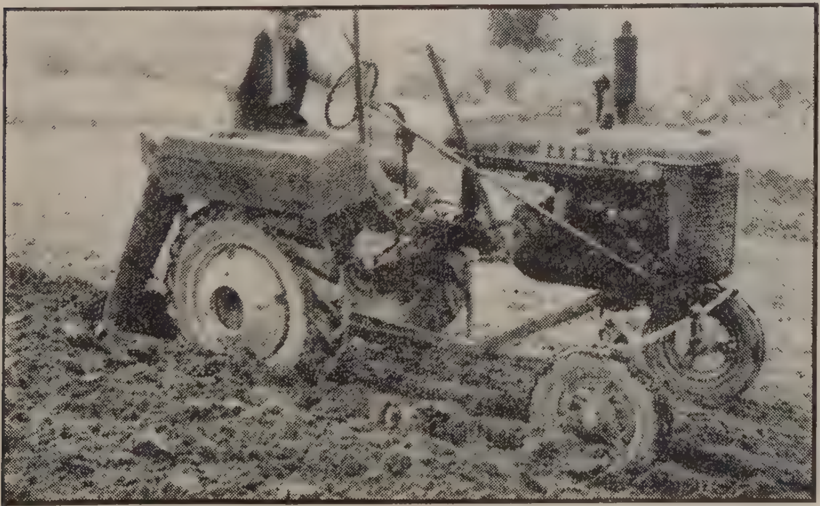


Fig. 1—The planting unit at work. The box is mounted on the mudguard within easy reach of the operator.

Planting a Field

The field planted was ploughed out of a 12-year-old cow pasture in July and, after cross ploughing and general cultivation, was ploughed again at the time of planting (October 23, 1946). It was ploughed in lands in the ordinary way except that as each alternate furrow was thrown potatoes were being dropped in front of it and so ploughed under.

Greened and sprouted potatoes were put in apple cases and taken to the field on a trailer, which was left at the head of the land to be ploughed. The plough was set to throw a furrow

15in. wide and 7in. deep, so that with planting in alternate furrows the crop came up in rows 30in. apart; that allowed the tractor to straddle two rows at cultivation time.

After the field had been struck out in the usual way the box was filled with potatoes and the tractor lined up for the second furrow. Put in low gear, the tractor was throttled back to walking speed, and as it moved up the furrow the potatoes were dropped down the chute at a rate which was found by experience to give the required spacing.

The chute is not vertical but offset to the right so that the potatoes drop on to the lower third of the previous furrow. They are covered before they can roll into the bottom of the furrow. In effect these potatoes are planted on about 2in. of loose soil and covered with a further 5in. The digger mouldboard of the plough used leaves the soil in a crumbled condition that is conducive to good germination.

Steering Not Difficult

On the other side of the land the return trip is also a planting one; the next run up and down is straight ploughing, and the following trip a planting one. Steering while concentrating on planting is not difficult, as the front furrow wheel is held lightly against the land wall so that the unit tracks straight with little attention from the operator. Any slight irregularities are corrected on the straight-ploughing runs.

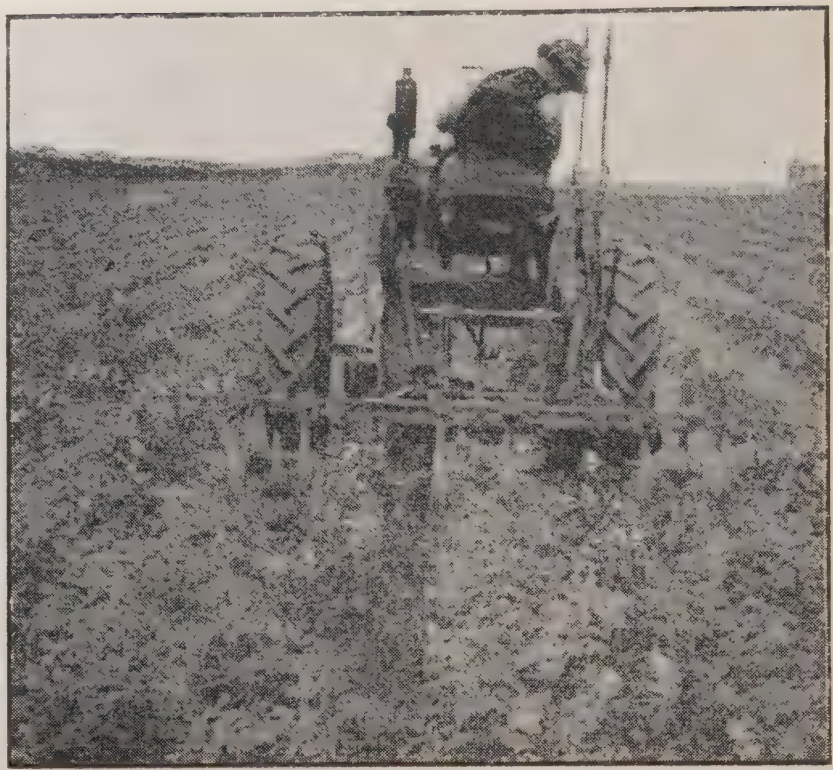


Fig. 4—The crop being cultivated two months after planting. Note the growth of the potatoes and their even spacing in the rows.

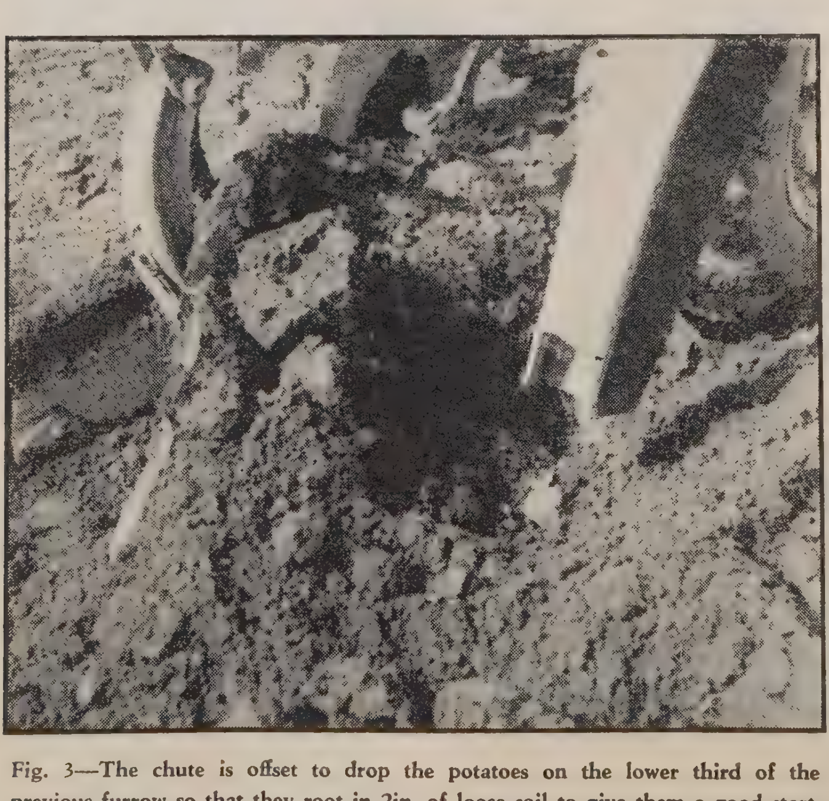


Fig. 3—The chute is offset to drop the potatoes on the lower third of the previous furrow so that they root in 2in. of loose soil to give them a good start.

Had this tractor been fitted with an integral double-furrow plough, every run up and down the field would have been a planting one and the planting time further reduced.

Applying Fertiliser

No provision has been made for fertiliser application, but it was felt that none was needed at that stage in view of the time the land had been in cow pasture. That has been borne out by the growth of the crop to date. Fig. 4 shows the crop being cultivated two months after planting, the excellent growth being apparent.

However, it would not be difficult to fit a home-made fertiliser attachment to the tractor; it could be done in the farm workshop. Alternatively, fertiliser bins are available for attaching to the side of this model and would form a neat set-up for putting fertiliser in the furrow in front of the potato planter.

The planter is quite efficient, and the designer is to be congratulated on producing a cheap, effective unit at a time when farm labour is at a premium.

"Once upon a time. . ."

[Sparrow Industrial Pictures Ltd.

WHEN you were very young did you ever have the joy of possessing a small buff-coloured book which began: "Once upon a time there were four little rabbits, and their names were

Flopsy,
Mopsy,
Cotton-tail,
and Peter"?

And did you follow with breathless interest the peccadilloes of Peter, who deliberately disobeyed his mother and ventured into the forbidden territory of Mr. McGregor's garden to sample his lettuces and such-like, and after being chased and all but captured by that irate gentleman at last managed to escape, minus shoes and jacket (the second lot of clothes he had lost in a fortnight!), and met his just deserts by being "not very well during the evening" and having to retire to bed and be dosed with camomile tea while the rest of the family had bread and milk and blackberries for supper?

Even if you had not reached the age where you could read the text for yourself, you could still revel in the adventures of the inimitable Peter without grown-up assistance through the many delightful drawings, whose delicacy of colouring and perfection of detail helped to make "The Tale of Peter Rabbit" a classic among children's stories. The book has been translated into several other languages, including French and Spanish, with great success. It is indeed indicative of the genius of Peter Rabbit's creator, Beatrix Potter, that though her childhood was practically devoid of all companionship with other children save a brother who was considerably her junior, and her entire education was supervised by governesses in the lonely seclusion of her Victorian nursery, she was able to portray so beautifully the world of fantasy with its strong appeal to the child mind.

Visits to Scotland gave her her first glimpse of country life—its loveliness of leaf and landscape, its rhythmic cycle of sowing and reaping, its revelation of the wonders of the animal kingdom—a life which held such an ever-increasing attraction for her that in later years she acquired land in the Lake District and eventually became as noted for her farming achievements as for her prowess with pen and brush. Her powers of perception heightened and her artistic talents stimulated by these halcyon holidays, the child Beatrix sketched with a naturalist's passion and precision the inhabitants of hedgerow, field, and woodland whom she loved so dearly.

During the period when most young ladies of her day were deriving their keenest enjoyment from parties, dances, and similar social pleasures, the shy, solitary girl spent the greater part of her time in museums drawing fossils or embroideries, or studying specimens under a microscope, and classifying and painting the numerous varieties of fungus she collected on her trips to the Highlands. As no one was on hand to write a treatise on fungi, however, she finally forsook that hobby in favour of making animal pictures for the families of her relatives and carried on an extensive correspondence with children.

The original Peter Rabbit story was in the form of an illustrated letter to cheer the convalescence of the five-year-old son of a former governess. Eight years later she decided to expand the idea into a book, and in 1900 an edition of 500 copies was printed at her own expense. Except for the frontispiece all the pictures were in black and white, the now-familiar water-colour illustrations being made at the suggestion of Frederick Warne & Co., who undertook the publication of "The Tale of Peter Rabbit" forthwith. The first of the series of "mouse" books, "The Tailor of Gloucester," likewise made its debut for the entertainment of a sick child and was privately printed before being submitted to Warne's. The lovable "Tale of Squirrel Nutkin" further established Beatrix Potter's popularity as a writer of children's literature, and there followed in swift succession another mouse story and a sequel to the now-famous Peter Rabbit.

It was after the completion of that delicious saga of domesticity about Mrs. Tiggy-Winkle (a hedgehog of commendably house-proud habits) that the author-artist bought a farm in the hill country above Lake Windermere. Though many years passed before she was able to make it her permanent home, she spent every possible moment there, learning the rudiments of farming from her manager, working in her garden, and producing book after book—each a masterpiece in itself and introducing a host of never-to-be-forgotten characters. (I seldom use a brush and dustpan without thinking of Mrs. Tittlemouse and her efforts to clean up after Mr. Jackson. Mention of pigs invariably reminds me of Aunt Pettitoes, the porcine equivalent of the old woman who lived in a shoe, and though fully in sympathy with her family problems and duly admiring of her son Pigling Bland, the impeccable hero of the piece, my heart always warmed to his brother Alexander, who was "hopelessly volatile"—a description which applies precisely to some of the small boys I know! And is not the fate of Timmy Tiptoes an awful warning to anyone tempted to overindulge in tit-bits!)

Hill Top Farm features in several of Beatrix Potter's books, notably "The Tale of Jemima Puddleduck," "The Roly-Poly Pudding," and "The Tale of Tom Kitten," giving readers a clear picture of the Sawrey farmhouse and its picturesque surroundings. The circumstances of her marriage and her long, happy life as Mrs. William Heelis, of Sawrey, are sympathetically detailed in Margaret Lane's aptly-titled biography "The Tale of Beatrix Potter." Her biographer, who is the Countess of Huntingdon in private life, says of her that old age became her like a bloom.

I think one of the secrets of Beatrix Potter's success can be gleaned from her own words: " . . . I write carefully because I enjoy my writing, and enjoy taking pains over it. . . . My usual way of writing is to scribble, and cut out, and write it again and again. The shorter and plainer the better. And I read the Bible (unrevised version and Old Testament) if I feel my style wants chastening."

She died in December, 1943, at the age of 77, and her last story, "Wag-by-Wall," intended as a "pendant" to the "Tailor of Gloucester," and published posthumously, is prefaced by a fitting tribute to one whose books have proved for countless children a passport to the magic realm of "Once upon a time."

Mary

First-aid Treatment for Victims of Accident or Sudden Illness

THE correct order of first-aid procedure in cases of accident or sudden illness is the subject of this article, the seventh in a series on first aid by C. Meachen, secretary of the St. John Ambulance Association, Wellington. The giving of stimulants and the treatment of shock are discussed in detail.

QUICKLY examine the patient from the head down for signs of injury or sickness, paying particular attention to the head, ears, eyes, and throat. Apply treatment even if the patient appears dead. When examining a patient do not uncover him unnecessarily or he is likely to become chilled, and chill increases shock. When clothes must be removed they should be taken off gently and carefully.

Make sure the patient can breathe. Keep crowds away and see he has plenty of fresh air. Examine the nose, mouth, and throat, making sure the breathing passages are free of obstruction. Remove any pressure from the chest and loosen constricting bands or tight clothing from round the neck.

If breathing is suspended or seen to be failing, an immediate attempt must be made to resuscitate the patient and restore natural breathing. Resuscitation methods have often succeeded after long periods of persevering work.

Shock may be prevented or lessened by placing the patient in something warm and by covering him with blankets or coats. Shock is an important factor in all cases of injury and sudden illness, and precautions must always be taken to combat its serious effects. Warmth, friction over the body toward the heart, and stimulants in certain cases are the best forms of treatment.

If the face is flushed and congested, lay the patient down, raise the head and shoulders, turn the head to one side, and apply warmth to the lower parts of the body.

If the face is pale, lay the patient on his back with his head turned to one side, then raise the legs and feet to increase the blood supply to the head.

Treatment of wounds: Bleeding wounds must always be attended to before other injuries. All wounds must be cleaned and an antiseptic lotion applied if available. Then the wound must be covered with a clean dressing to prevent infection.

Fractures must be attended at the place where the patient is found, even if it is in the middle of a busy street. The broken bones must be set at rest by the application of splints or other means of preventing the broken ends from moving and causing further injury. Always treat a doubtful fracture as a fracture.

Convulsions or fits: Raise the head and shoulders, and do not use force to control the patient. Prevent him from injuring himself, and hold a firm, wrapped object, such as a stick, between the teeth to prevent the tongue being bitten. If it is difficult to open the patient's mouth, hold the nose, closing the nostrils, which forces the patient to open his mouth to breathe; then place the object between the teeth. If the patient has false teeth, remove them in case they fall into his throat.

Burns and scalds must be covered as soon as possible to exclude the air from the damaged and exposed nerve ends and to prevent infection. It is very important in all cases of burns and scalds, however slight they may appear, to treat the patient for shock.

Electric shock: Switch off the current if possible. Failing that insulate yourself from contact with the patient's body and from objects charged with electricity by using dry insulating materials while giving assistance.

Poisoning: Persons who have swallowed a poison that does not burn the lips, mouth, or throat must be given an emetic to make them vomit if they are conscious. If the poison burns, it must be neutralised at once by giving an antidote for the poison taken. In all cases of poisoning call medical assistance at once, stating if possible the name of the poison taken.

Suffocation and gas poisoning: Immediately move the patient into the fresh air, or adjust a respirator on him if it gives protection against the gas in the atmosphere. Apply artificial respiration if breathing has ceased or is failing, except in cases of certain war gases which damage the lungs.

TEMPERATURE, RESPIRATION, AND PULSE

Normal temperature, respiration rate, and pulse rates are:—

Temperature	98.4 degrees Fahrenheit
Respiration rate	12 to 15 a minute
Pulse rate:	
Adults	70 to 80 a minute
Children	80 to 100 a minute
Infants	100 to 120 a minute

ADMINISTRATION OF MEDICINE

Always read the label of a medicine bottle carefully to make sure the right bottle is being used and that the correct dose is given. Always give exact and regular doses, and never give or take medicine in the dark in case the wrong bottle is used.

Pour out medicine with the labelled part of the bottle uppermost to prevent the medicine running down over the label. If the instructions on the label become indistinct, there is danger of the wrong dose being given.

CARE WITH STIMULANTS

When a patient is conscious and able to swallow, **not before,** a stimulant may be given, except in cases of hemorrhage (bleeding), either external or internal, and head or internal injuries.

An unconscious person cannot swallow, and fluids or foods given by mouth may enter the windpipe and lungs, causing serious complications. If the patient is in a condition to take a stimulant, and if the nature of the case calls for one, any of the following may be given: Hot tea, black coffee, or milk (care being taken not to scald the patient), or sal volatile (one teaspoonful in half a tumbler of water).

In certain cases the patient can be stimulated by holding smelling salts or sal volatile on cotton wool near the nostrils, by applying warmth to the body with blankets or hot water bags, and by rubbing the limbs and body toward the heart. But always bear in mind the nature of the complaint before giving any form of stimulation.

Do not give alcoholic stimulants unless they are specified in the treatment or ordered by a doctor. The after-effect of alcoholic stimulants may be a state of mental depression, which increases the de-

gree of shock, a serious factor in all cases of injury and sudden sickness.

Stimulants should not be given in cases of hemorrhage because of their stimulating action on the heart, which causes an increased loss of blood. In cases of internal hemorrhage there is also the danger of the stimulant making its way to the seat of the injury and escaping into the internal cavities of the body. If the blood pressure is increased by stimulation in a patient with head injuries, there is danger of an injured or bruised blood vessel being ruptured, causing the grave complication of cerebral hemorrhage and compression.

SHOCK

Shock is a condition which affects the nervous, respiratory, and circulatory systems and interferes with the normal functions of the human body. It may affect a patient directly after an accident, illness, fright, or mental disturbance, but in many cases, especially after accidents, the effects are not experienced until a considerable time later. Treatment for shock should be given immediately in all cases, and precautions taken to guard against the secondary or reactionary form of shock.

Causes

The causes of shock are:—
Severe pain and injuries.
Severe hemorrhage or bleeding.
Certain forms of illness.
Poisoning.
Insect bites and stings.
Exposure and starvation.
Fright and mental disturbances.

Signs and Symptoms

1. The patient becomes cold, pale, and faint, and often shivers.
2. The lips become ash-coloured and bloodless.
3. The patient may break out in a cold sweat and the skin has a gooseflesh appearance.
4. The pulse is feeble and may even disappear.
5. The breathing becomes quick but shallow.
6. The patient may be semi-conscious at first, but later may become completely insensible.

Treatment

1. Lay the patient down on a bed if possible, or on something warm, with the head low and turned to one side.
2. Make sure he receives plenty of fresh air, and loosen tight clothing about the neck, chest, and waist.
3. Apply warmth by wrapping the body in blankets and by placing hot water bottles to the hands and feet, being careful not to burn the patient. Warmth may also be promoted by applying friction over the surface of the body and limbs, rubbing toward the heart.

. . . FIRST AID TREATMENT

4. If an injury is the cause of shock, apply the treatment that appears most suitable, paying particular attention to the arrest of bleeding.
5. If shock is caused by illness, if possible determine the nature of the illness, then apply the most suitable treatment.
6. Always try to calm the patient and remove any cause likely to increase the state of shock.
7. Do not give alcoholic stimulants, but if the patient is conscious and able to swallow, and not suffering from any form of hemorrhage or head or internal injuries, give sips of hot tea, hot black coffee, hot milk, or sal volatile.
8. In cases of severe shock, especially when caused by an injury, sudden illness, or some unknown cause, call a doctor.

* * *

QUESTIONS AND ANSWERS

Waterglass: What is the waterglass which is used for preserving eggs, and what is the treatment if a person's face and eyes should be splashed with it?

Waterglass is a solution of sodium silicate of about 7 per cent. When dry it forms a film which is very hard. It is a non-corrosive alkali. If the face and eyes are splashed with a solution of it, the correct first-aid treatment is to wash the affected parts freely with warm water. If that does not give relief, medical aid must be sought at once.

* * *

Treatment of epilepsy: Am I right in asserting that a patient who has just recovered consciousness from an epileptic fit should not be given stimulants such as tea and coffee? According to the textbook, the face being pale, the administration of stimulants would be in order. Is epilepsy an exception in which a stimulant might precipitate a second fit?

I see no reason for withholding hot tea and coffee from a patient who, having recovered from an epileptic attack, is fully conscious and able to swallow. The patient may be exhausted after the fit, and hot drinks will not precipitate another seizure.

* * *

Readers are invited to forward questions on problems dealing with first aid or home nursing to P.O. Box 25, Te Aro, Wellington, E2.

I Go a-carolling

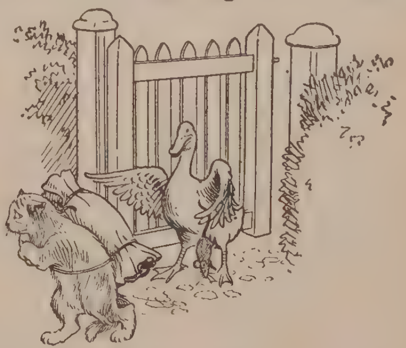
I HELPED friends produce a Nativity Pageant in a city church this Christmas. It was simple, yet extremely moving. And for another group I planned just the "centre" of the Nativity scene, while special carols were sung beneath a lighted tree. By way of contrast I tramped miles with our choir up and down our hilly roads, singing carols and the well-loved old hymns. It was the most satisfying experience. I was also among the big choir which sang carols in the Town Hall. The stories behind the carols and the way they're bound up with our history is very interesting.

One day just before Christmas I saw a set of cut-out Nativity figures made of three-ply. I lost my heart to them instantly, but considered the price was beyond my pocket. However, the more I thought of them the more I wanted them, and before I left the shop I'd paid over the money and brought them away. When I returned home there was the notification concerning my prize—and the cheque. Very nice!

I bought a paper set of figures last year, mounted them on cardboard, and set them along our mantelshelf, but the group I have now are much more durable. I mounted them on a strip of wallboard, strewed hay round them, and put them just inside the west door of the church. Everyone warms to the thought of Christmas that way, I'm certain.—**"London Lass," Wellington.**

Cat Disgraced

I HAVE been a reader of the "Good Neighbour" pages for some time now and I must say I thoroughly enjoy them. This evening while feeding the ducks I saw a most unexpected sight. One of the brood suddenly started going round in circles and dodging about in the most ungainly manner. Imagine my surprise when I discovered she was chasing a mouse. Finally she managed to scoop it up into her bill and the last I saw was a very much alive mouse disappearing head first. I am wondering if it is a common occurrence for ducks to dine on mice—perhaps some "Good Neighbour" could tell me. If so, I think I will buy some more ducks and get rid of my cat, who spends most of his time curled up on the hearth or the seedbeds.—**"Scarlet Blossoms," Otorohanga.**



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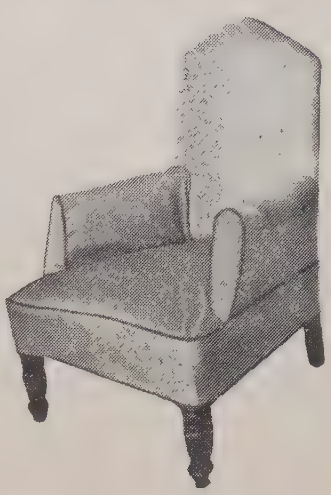
NEW LIFE FOR AN OLD CHAIR

By **EVA TOPPING,** *Rural Sociologist, Auckland.*

FURNITURE is costly and sometimes scarce today, and as there is no great variety it is often a case of taking what is offering even if it is not exactly what is wanted. There will be more when supplies have overtaken the demand, so why not give the old things a "face-lift" and wait for the new ones until there is a greater variety of styles from which to select? An article in the January issue of the "Journal" described the conversion of an aged dining-room chair into an up-to-date fireside or bedroom chair. This article shows how an old armchair, vintage early 1900's, was altered and re-covered to make it both more comfortable and more suitable for a present-day sitting-room.



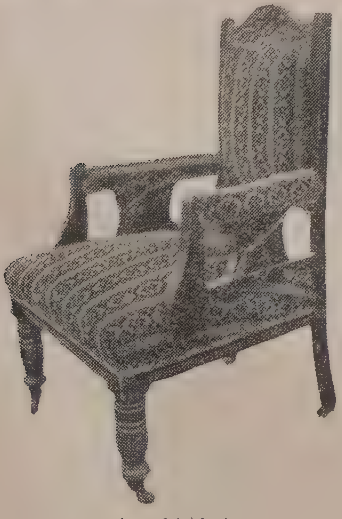
The "new" chair.

AS a first step, the chair was thoroughly beaten and brushed in the open air. Then the castors were removed and a short piece was sawn off the back legs to make the chair tilt backward a little and so take away the "poker back" effect. A little more work with the saw altered the shape at the top of the back and gave a smoother and more pleasing line to the arm rests.

Next the gap between the back and seat was filled in with a piece of plywood. Long fine tacks are the ones to use, as they will grip firmly and will not split the wood of the framework. The top and sides were tacked on but the bottom was left free at this stage.

The legs needed some treatment, so the old chipped varnish was stripped off by scrubbing them with hot water in which some caustic soda had been dissolved.

Great care should be taken in using caustic soda: Do not make the solution too strong, use an old scrubbing brush, do not wet the hands, and, above all, keep the soda and the soda solution well away from the reach of the children. Painter's soap can be used, but the same care is necessary.



The old chair.

There are also commercially-prepared paint and varnish removers which dissolve one coat of varnish at each application, and there is the safe but laborious way of removing varnish with sandpaper. However, deep indentations on turned legs are difficult to deal with and, providing reasonable care is exercised, the caustic soda solution is both quick and simple.

When the legs were thoroughly dry they were rubbed smooth with sandpaper, finishing with a fine grade. Then they were brushed free of dust and revarnished.

At that stage the chair looked more dreadful than ever.

Padding the Arms

Hessian (which could be washed sugar bags or manure sacks), dressed flax or tow, plenty of tacks and pins, strong fine string, and a large packing needle were the next requirements.

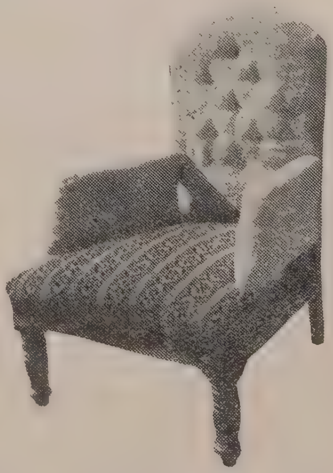
Hanks of the flax were wound tightly round the wooden front of the arm rest and secured with string. If no flax is available, strips of clean cloth, sacking, or old stockings will do for this padding. The stuffing must be pulled tightly and bound smoothly; beating with a flat piece of wood will help to make an even surface.

A piece of hessian to cover the arm was cut and tacked on the inside of the lower arm rail, then pulled up tightly and pinned to the upholstery on the arm rest. Bundles of flax were pushed between the inside of the wooden centre piece and the hessian, then the cover was pulled up and over the arm rest and tacked into place on the outside of the top rail. A narrower piece of hessian was tacked on the lower rail and bundles of flax set in the gaps and over the centre piece. The chair was laid on the side while doing this so that the stuffing did not slip out of place. When sufficient flax was pushed in the hessian was firmly pinned to the top of the arm rest.

Then the packing needle and string came into use to sew the two parts of the covering together, along the side and at the end by the back; a good turning was made along the side to give a neat and firm join. Next a shaped piece of hessian was cut to fit over the front of the arm, leaving a generous turn-in, and it was also sewn on with the string. The second arm was done in the same way, care being taken to make the front piece exactly the same shape but in reverse.

Padding the Back

More hanks of flax were set in place along the two sides of the back and secured with string by threading the packing needle and stabbing it right through the upholstery. Plenty of flax was arranged over the top wooden part so that there was no apparent join between the new flax padding and the original upholstery. This also was secured with the needle and string by carrying the string over the top and through the upholstery from back to front.



Castors removed, back legs shortened, and back and arms repadded.

Next a piece of hessian large enough to cover the inside back completely and go over the top and sides was cut.

Do not be sparing of material at this stage; it is easy to snip a little off, but almost impossible to make a satisfactory job if pieces have to be added.

The bottom was pulled through to the back between the plywood and the frame, a fold made, and tacks driven through plywood and hessian into the frame. More flax was put in at the bottom of the back to meet the original upholstery. Take time over this part of the work; pin the hessian halfway up and sit in the chair to try the effect of the stuffing, adding or removing pieces until the right amount is discovered, for this is the point at which the comfort of the back is attained.

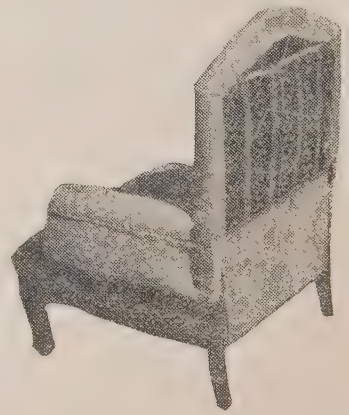
That point settled, the hessian was pulled up over the back and tightly tacked; first one side was turned under and tacked firmly, then the other side, pulling the covering tight and straight. The top was turned in and tacked securely, making pleats at suitable points to give a smooth finish.

If the back is to be buttoned, now is the time to do it. Mark the places carefully with pins, making sure that all lines are straight and the points equally spaced. Take the packing needle, threaded with a long piece of stout string, and stab it through from the back. Place a short length of twine folded in two on the marked spot, make a stitch over it, pull it very tight, and knot the string at the back. Go on to the next spot and repeat until all "buttons" have been marked. The string must be pulled very tight or the depressions will not be deep enough.

Cut a piece of hessian to fit the back and secure it to the frame with tacks to finish the back neatly.

Covering the Chair

The new cover can be made loose, tacked on, or sewn on over the padding. The material selected will probably be the deciding factor in the choice of treatment. The chair in the photograph has a cover made by combining two methods, giving the effect of tight upholstery with the advantage of being easily removed for laundering, as the material is light fawn with pipings of cord covered in a darker colour. Because the cover was made to be removable the buttoning of the back was omitted, but when required it is done in the same way as previously described, with small covered buttons to replace the string loops on the right side. Here again the string must be pulled very tightly through to the back and tied firmly behind each button.



How the flax padding is secured to the back. A piece of plywood fills the gap between back and seat.

Whichever type of covering is made, the preliminary steps will need to be carefully done as the secret of a successful job lies in frequent trying on and careful fitting.

Place the material over the chair on the wrong side and pin it to the padding. If the material is patterned, make sure that the centre pattern falls on the centre of back and seat portions, and that the two arms and front arm pieces match. Leave good turnings of about 1in. on seam lines and a generous tuck-in of about 5in. down sides and back of the seat and at the lower edge of the back.

For a loose cover leave one side of the back open, face the edges, and sew on press studs or stitch the edges together when the cover is on the chair. Tacked-on covers will need cord or gimp for trimming and to hide the tacks.

Photographs by Sparrow Industrial Pictures Ltd.

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Choosing Plants for the Flower Garden

AUTUMN is the best time to plant most shrubs, trees, herbaceous flowers, and other permanent or semi-permanent plants. Some hints on choosing plants for the garden are given in this article by J. P. Hudson, Horticulturist, Wellington.

AS the building of new homes gathers momentum, thousands of gardeners are faced with the problem of buying trees, shrubs, and other plants with which to stock their sections. Advice is sought from friends, nurserymen, gardening magazines, books, and other sources. Much of the advice given is sound, but some is conflicting and some probably quite misleading. Many popular and widely-advertised plants produce blooms which are first class on the bench of a flower show but make a poor display in the garden, where massive colour effects are required.

There are also many first-rate plants which are well worth while planting in a large garden or public park, but are not so suitable for the small garden, as their display of flowers has only a short season. Where space is limited every plant must not only add colour and interest to the border but must maintain its show for a long period. It is hard to justify a place in an eighth-acre section for a plant which is in flower for only 2 or 3 weeks of the year when there are others which will flower continuously for 2 or 3 months.

Other plants again, though most desirable, are too slow growing, too subject to pests and disease, or too particular about soil and situation to be really suitable for planting in the home garden.

The Award of Garden Merit

There seems to be a need for some scheme of recognising plants which are most suitable for the home garden. A scheme of that sort was started in England in 1921 by the Royal Horticultural Society, which established the Award of Garden Merit to mark plants which were of proved and outstanding value for garden use.

Plants are considered for this award only after their performance has been watched in the garden (not on the show bench) for a sufficient time for their character to have shown up. They need not be new introductions—in fact many plants which have received the award are old garden favourites, such as the yellow Spanish broom (*Spartium junceum*), which has been in cultivation for 400 years, but which flowers freely and for a long period every year.

[*Photo News Ltd.*

Gazanias can be used to break the line of a concrete retaining wall. They flower for months each year if fading flower heads are regularly picked off.

The Royal Horticultural Society publishes a booklet from time to time listing and describing the plants to which the award has been given and giving brief instructions about their management and preferences for soil and situation. Gardeners have come to realise that plants holding the award can be bought with confidence, as they will grow well and give satisfaction in the garden.

A New Zealand Scheme?

A scheme of this sort, sponsored by some independent organisation such as the Royal New Zealand Institute of Horticulture, would be welcome here.

Plants selected for award should, under ordinary garden conditions

Be easy to grow and reasonably quick-growing;

Be reliable and regular in flowering and fruiting;

Make a worth-while contribution to the garden display for a long period every year;

Be free from noxious habits such as spreading; and

Be not unduly subject to diseases and pests.

The award should be given sparingly if its value is to be maintained, but the scheme could be invaluable in providing the home gardener with a list of plants which he could buy with confidence and which would give satisfaction in his borders. Separate classes might be made in the award for bulbs, herbaceous plants, shrubs, trees, and other groups of plants, and it would also be necessary to specify whether a plant was hardy anywhere in New Zealand or suitable for planting only in the warmer districts.

Care in Selection

Meanwhile, in the absence of some such scheme, the home gardener should choose his purchases with discrimination. Much can be learned by looking at neighbours' gardens or public parks, but the observant gardener will notice that many plants, especially shrubs and trees, that make a gorgeous display every season do so for only a few days or weeks. Those plants hardly pay their rent in small gardens, where it is best to concentrate on plants which bloom for a long period each season.

Trees and shrubs which normally grow into large specimens are also unsuitable for small gardens, where they can be kept in bounds only by hideous periodic mutilation.

Work in the Garden for May

Begonias which have been flowering in pots should now be gradually dried off. When the foliage has died down the pots should be laid on their sides in a frost-free place.

Bulbs, such as crocus, ixias, and snowdrops, may still be planted to flower in spring.

THE FLOWER GARDEN IN MAY . . .

Chrysanthemum stools are often left in the border until required for propagating in the spring, but in very cold districts, where some losses may occur, the plants are best lifted in autumn and planted for the winter in a cold frame, where they will require little water or attention until they show signs of growth in the spring. Even in mild districts many growers lift the roots and winter them in a frame to ensure a copious supply of cuttings in the spring, and also to leave borders vacant for digging during the winter.

Cyclamen in pots should now be growing strongly. Water them every 10 days with liquid manure diluted with water to the colour of weak tea, but be careful not to leave the top of the corm wet, as that often causes young leaves and flower buds to rot. Sprinkling a pinch of flowers of sulphur in the crown of the plant is a good insurance against rot developing.

Dahlia tubers should continue to be lifted as they go out of flower. Store them in a cool, frost-free place.

Gladiolus corms which have been lifted and dried off as described last month should now be ready for cleaning. It is not essential to remove the outer skin from the corms, but it is always worth while to do so, as it does not harm them but enables diseased corms to be picked out. Several serious gladiolus diseases are carried over from year to year on the corms. Any corms showing a bad scar, a rotten place, or lumps and scabs should be burned; it is folly to plant them and so perpetuate the disease and perhaps contaminate a fresh piece of land.

To overlook a few small infections on apparently-healthy corms is very easy. For that reason, and especially when new stocks are bought, it is a wise precaution to dip all the corms just before they are planted in a solution of 1 part in 1000 of acid mercuric chloride. Leave the corms in the solution for 1 to 2 hours, then drain them, allow them to dry, and plant them at once. Dipping should be done in a glass or wooden container and care should be taken, as the mercuric chloride is intensely poisonous. (A solution of the right strength can be obtained by asking a chemist to dissolve 10 grammes of mercuric bichloride in 25 c.c. of concentrated hydrochloric acid; add this stock solution to 2 gallons of water to make up a dip of the required strength.)

Lonicera nitida is one of the finest plants for producing a dense, neat, quick-growing garden hedge in all except exposed coastal places, where salt winds may spoil its appearance. It requires trimming two or three times a year to keep it neat, but overgrown hedges can safely be cut back hard, as new shoots are produced freely even from old woody stems. Plants can be raised from cuttings, which root very easily. Even small branches inserted in the ground will often root. *Lonicera nitida,* which is not stock proof, should be protected by a fence if cattle or sheep have access to it.

Palms growing in pots need attention from time to time, though they are among the easiest of house plants to grow. Their leaves should be carefully wiped with a moist cloth or sponge at least once a month, and once a year they should be either topdressed or repotted. Palms can remain healthy in far smaller pots than most pot plants, and as long as they are looking healthy and growing there is little point in repotting them. In that case scratch off with a pointed stick as much surface soil as can be removed without damaging the roots and replace it with new soil worked firmly in between the roots. If a plant has stopped growing, and the pot is very full of roots, shake out as much of the soil as possible from between the roots, and repot the palm in a pot not much larger than the one from which the palm was taken. Pot firmly, working the soil a little at a time well between the roots with a stick.

Pots and bowls of bulbs which have been standing under ashes in a cool corner to root should be taken indoors when the new shoots start to show. Remove the ashes from between the shoots, wipe the pots clean, and keep them in a light but cool room until the flower buds appear between the leaves. They can then be taken into a warmer room to flower without risk of the leaves growing too tall in proportion to the flowers. For the same reason bulbs should be watered only sparingly until the flower buds appear.

[*Sparrow Industrial Pictures Ltd.*

Grass edges look best when kept neatly trimmed. Where lawn and path are on the same level the edge can be cut quickly and efficiently with a circular lawn trimmer.

Scythes and reap hooks are quickly spoiled if they are not correctly sharpened. The carborundum stone should be swung so that it simultaneously rubs the edge and the ridge at the back of the blade. That ensures that the edge is maintained at the correct angle and does not get thick. A thick blade cannot be given a keen edge.

Sulphate of iron, which is used for a variety of purposes in the garden, stains clothing badly. It also causes corrosion if a solution of the chemical is left in contact with watering cans or syringes for any time. Utensils should be thoroughly washed out after using sulphate of iron solution, and it is best to wear old clothes when spraying with it.

To remove iron stains from clothing sprinkle them with salt, squeeze lemon juice on the salt, spread the garment in the sun to dry, then rinse it thoroughly with water. Alternatively, sprinkle the stains with oxalic acid crystals, moisten them with hot water, and then rinse well in hot water, repeating this process if necessary until the stain disappears. (Both these treatments may take the colour out of clothes and should first be tried out on a corner of the material.)

Sulphur compounds cause lead paint to turn dark brown or black. Sprays containing sulphur, such as lime sulphur or liver of sulphur, should not be used in the vicinity of painted woodwork, and care should be taken not to let the spray touch the house.

Sweet peas are among the most useful flowers for cutting for the house if they have long straight stems, which are produced only by plants which are well grown. Much depends on the care taken in preparing the site where sweet peas are to be grown next year. The strip of ground prepared for them should be at least 2ft. wide and should now be dug over as deeply as the soil allows, but without bringing the light-coloured subsoil to the surface. It is an advantage, however, to break up the subsoil with a fork as digging proceeds to give the plants a deeper soil in which to root. A very generous dressing of compost, old leaves, animal manure, or any form of humus should be worked into the soil, together with an application of the general flower-bed fertiliser mentioned last month, and a dressing of 4oz. of lime a square yard.

Two Bad Garden Weeds

Convolvulus (bindweed) is one of the most troublesome garden weeds, very difficult to eradicate when once it has become well established because of the great extent of its underground system of roots and stems, any part of which can send up new shoots from below the surface and grow into a new plant if left in the soil. Every time new shoots are produced a certain amount of the food stored in the underground parts is used up, but by the time the shoots have grown a few inches high they have replenished the underground system with new stores of food. However, if the young shoots are cut off regularly before they are 6in. high, the underground food reserve will gradually be used up and the plant killed. The old gardeners' saying that convolvulus can be killed by "hoeing it off every Wednesday" had more than a grain of truth in it.

Any green plant can be killed out in time if its young shoots are cut off frequently enough. If that is done every time new shoots appear, and before they are 6in. high, in time it will cause the roots to die right out. However, it may take some time—even years—before the root stock is completely killed, though the new shoots begin to look sickly and yellow after the first few cuttings.

Standard weedkillers, such as sodium chlorate, will do much to weaken convolvulus if used correctly, but, of course, they preclude the use of the ground for cropping for several months.

No trials of weed-killing hormones on convolvulus have so far been carried out by the Horticulture Division, but a number of users report that these hormones have shown promising results on the weed. One, or in some cases two, applications of weed-killing hormones, made up according to the maker's directions, and applied as a fine spray to cover the leaves of convolvulus, are reported to have cleared the plants almost right out, killing the tops and most of the underground stems and roots. It is said that the spray works best if applied in late spring or early summer when the plants are growing rapidly, especially if used in warm weather when the temperature is higher than 70 degrees F.

Flower and runner of convolvulus.

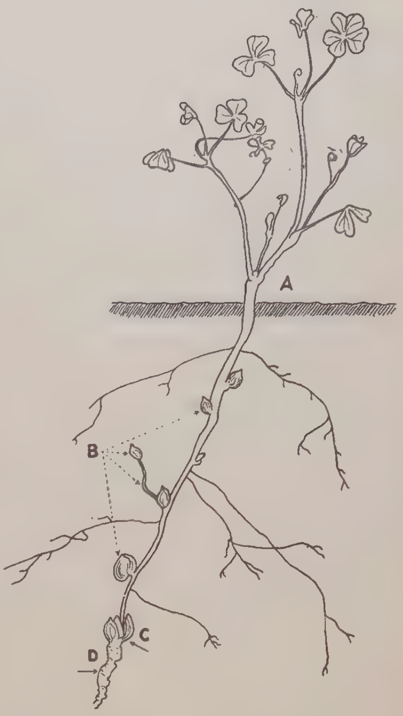
A strong warning must be given about the danger of indiscriminate use of hormone weedkillers which are lethal to many garden plants, especially herbaceous and annual flowering plants, tomatoes, and vegetables. Care must be taken to avoid the spray drifting on to garden plants, and spraying is best done on a windless day. Tomatoes are so sensitive to the weed-killing hormone that equipment used for spraying weeds with this chemical should not be used for work on tomatoes until some satisfactory way of cleaning the equipment has been devised.

Ground can be reinfected with convolvulus by seed or underground roots and stems from plants in neighbouring property. Underground invasion can be prevented to some extent by sinking sheets of old iron in the soil as a barrier, but freedom from convolvulus in a district where it occurs is achieved only by perpetual vigilance.

Oxalis, of which there are several species, is another very troublesome weed in many gardens. Though they have no extensive underground root and stem system like convolvulus, several species have an unusual method of increasing themselves by means of small bulbs. These are produced in large numbers by each plant, and are then "planted" at various depths in the soil both below and to the side of the parent by slanting contractile roots in a manner which botanically is both ingenious and unusual—though the gardener is hardly likely to take a sufficiently-detached view of the weed to regard it in that manner! Oxalis also spreads by prolific seeding.

Limited experience of the weed-killing hormones so far does not hold out much hope of controlling oxalis with the hormones at present on the market. These chemicals are reported to kill the leaves which are wetted, but the weed is said to grow up again apparently undiminished. That is possibly because the bulbs become detached from the parent plant at an early stage and would thus not receive any dosage of hormone as the chemical passes down the stem. It is too early to say that hormone weed-killers will never be effective against oxalis, but the habits of the plant may make it a hard one to kill by this means.

The only method of reducing oxalis is a constant war of attrition. Every shoot should be cut off as soon as it appears above ground. These shoots shrivel and die if the weather is hot and dry, but reroot readily if left lying on the surface in damp weather; if possible, therefore, they should be collected up if there is likelihood of their rerooting.



An oxalis plant. A—Ground level. B—New bulbs forming. C—"Mother" bulb. D—Shrivelled contractile root.

The small, shining, brown bulbs, varying in size from a pinhead to a pea, or larger, should be collected and burned at every opportunity when the soil is cultivated. Oxalis should never be left uncut until it flowers and goes to seed.

Only by constant attack can oxalis be gradually reduced in a garden where it has been allowed to establish itself. A number of gardeners testify to the fact that oxalis can, in fact, be eradicated by patient and diligent methods.

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MONEY-BACK GUARANTEE

MANY VARIATIONS OF A BAKED PUDDING RECIPE

★

By EVA TOPPING,
Rural Sociologist, Auckland.

★

LEMON PUDDING

A VERSATILE pudding—one recipe and many variations in flavours, sauces, shapes, and ways of serving—is the subject of this article. It is easy to mix and cooks reasonably quickly, so when the housewife is a little pushed for time in preparing dinner this is just the pudding to save the situation. It is always in season in one variation or another, and can often provide the answer to the ever-recurrent question "What shall we have for a pudding?"

HERE is the basic recipe in quantities sufficient for 4 reasonable portions.

½lb. of flour
1 teaspoon of baking powder
3oz. of fat
1 egg
3 tablespoons of sugar
about ¼ pint of milk
pinch of salt

Measure the flour, salt, and baking powder into the sifter. Cream the shortening and sugar together, add the egg unbeaten, and beat them again. Sift in the flour, baking powder, and salt, and stir thoroughly, adding just sufficient milk to make a soft, heavily-dropping batter. Put the mixture into a greased dish or tin and bake it for 20 to 30 minutes in a fairly quick oven.

The fat can be butter, lard, dripping, vegetable fat, or a mixture of any. Dripping is quite successful; even unclarified dripping can be used if the flavourings of the variety of pudding are strong—for instance, spices and cocoa. Finely-shredded suet will serve, but the pudding is then a little heavier in texture.

The egg can be dispensed with and a little extra milk used, but the pudding is not so light or so tender. The flour can be ordinary flour or wholemeal and white in equal quantities. For a short, crisp pudding replace 1 tablespoon of flour with 1 tablespoon of cornflour to each ½lb. of flour used.

Variations

Here are 15 variations of the basic recipe. A glance around the kitchen shelves may bring ideas for even more.

Lemon or Orange Pudding

To the quantities given add the grated rind of 1 lemon or orange and the strained juice. Less milk will be needed to mix the pudding—probably none if the fruit is fairly juicy. Serve with top milk or lemon-flavoured custard.

Jam and Coconut Covering

Using the basic recipe, bake the pudding and turn it out upside down on to a warmed dish. Spread the top liberally with warmed jam and sprinkle thickly with desiccated coconut.

Banana Cake Pudding

Mix the plain pudding recipe, grease a wide, flat dish and lay pieces of banana cut lengthwise in the bottom. Put half the pudding on the banana, smooth the surface, arrange another

RUIT-FILLED SANDWICH

layer of banana, and cover it with the rest of the pudding. Serve turned out upside down to show the baked banana.

Fruit-filled Sandwich

Bake the plain recipe in two sandwich tins. Drain some stewed fruit, keep the juice, and beat the fruit to a pulp. Thicken the juice with cornflour, making it thick enough to coat the back of a spoon. Spread the fruit pulp between the two layers of pudding and pour the thickened juice over the top layer. Almost any fruit will make this dessert; in the one illustrated stewed plums were used. Bottled fruits are suitable. Soft fruits like raspberries and blackberries can be used raw; crush them with sugar and spread the pulp between and on the two layers.

Rainbow Pudding

Mix the plain pudding, and fill a sandwich tin with a third of it in the natural colour. Tint the remainder with cochineal, and fill a second tin. Add a dessertspoon of cocoa and a little more milk to the last third, and fill another tin. Turn them out, spread warm jam between the layers, and serve with custard or with jam sauce.

Marble Pudding

The method is the same as for rainbow pudding but put the three colours, a spoonful of each in turn, into one dish.

Ginger Pudding

To the plain recipe add 1 teaspoon of ground ginger and substitute 1 tablespoon of golden syrup for 1 tablespoon of sugar. Serve with warmed and thinned golden syrup.

Little Cinnamon Puddings

Add ground cinnamon to the plain recipe and bake it in cups or small moulds. Turn them out on individual plates and top them with hard sauce. For the sauce take 2oz. of butter and 2oz. of soft brown sugar or icing sugar and beat them until they are soft and creamy, flavouring with ground cinnamon to taste. Put the sauce on at the last minute before serving or it will melt too rapidly.

Cake Pudding

Add dried fruits—currants, sultanas, raisins, and peel—to the plain recipe.

Marmalade Pudding

Use only 2 tablespoons of sugar and add 2 to 3 tablespoons of marmalade. If the marmalade is moist, less milk will be needed. Half wholemeal flour and half white is very successful with the marmalade pudding.

Chocolate Pudding

Add 1 large tablespoon of cocoa to the mixture and use a little extra milk.

LITTLE CINNAMON PUDDINGS

Brush the top with milk and sift on a coating of sugar to make a "crusty" top.

Plain Pudding with Chocolate Sauce

Make the plain pudding, turn it out, and coat it liberally with piping hot chocolate sauce. Ingredients for the sauce are:

1 cup of water
1 large dessertspoon of sugar
2 large dessertspoons of cocoa
1 large dessertspoon of cornflour
vanilla essence to taste
pinch of salt

Boil the sugar and water for 4 to 5 minutes to make it syrupy. Mix the cocoa and cornflour with a little cold water; add a few grains of salt and then the hot syrup, stirring hard. Cook the sauce for 3 minutes, stirring continually, flavour it and pour it over the pudding.

Wholemeal Date Pudding

Use half wholemeal and half white flour. Add chopped dates or walnuts and dates.

Coffee Pudding

Omit the milk for mixing and add strong coffee essence. Serve the pudding with a hard sauce flavoured with coffee essence and sprinkled with chopped walnuts. Coffee pudding is best made in small moulds like the cinnamon puddings illustrated.

Coconut Pudding

Add a cupful of desiccated coconut to the plain mixture, using extra milk to mix to give the right consistency.

Photographs by Sparrow Industrial Pictures Ltd.

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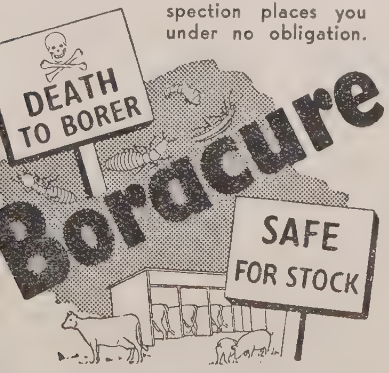

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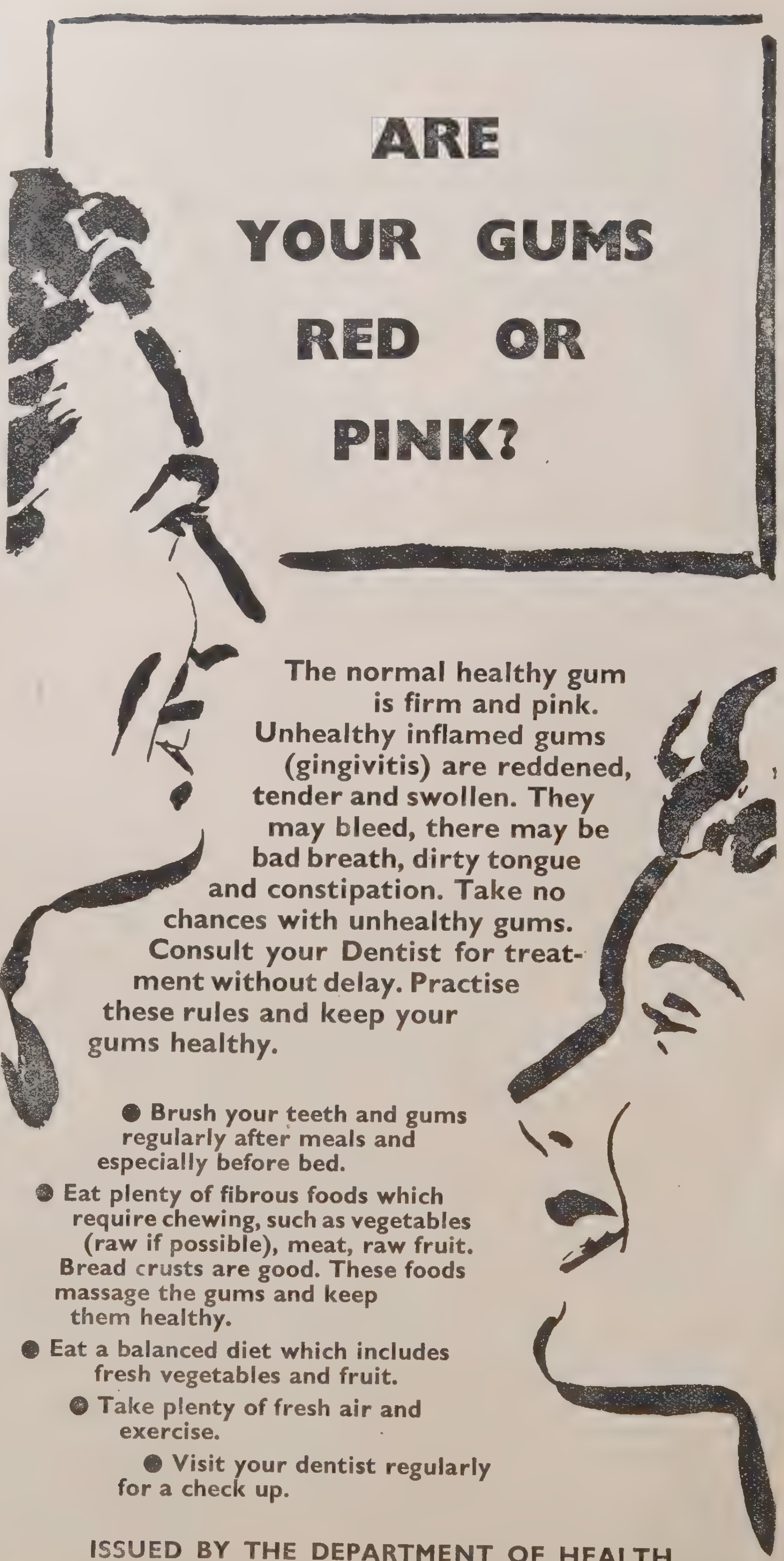

ARE YOUR GUMS RED OR PINK?

The normal healthy gum is firm and pink. Unhealthy inflamed gums (gingivitis) are reddened, tender and swollen. They may bleed, there may be bad breath, dirty tongue and constipation. Take no chances with unhealthy gums. Consult your Dentist for treatment without delay. Practise these rules and keep your gums healthy.

- Brush your teeth and gums regularly after meals and especially before bed.
- Eat plenty of fibrous foods which require chewing, such as vegetables (raw if possible), meat, raw fruit. Bread crusts are good. These foods massage the gums and keep them healthy.
- Eat a balanced diet which includes fresh vegetables and fruit.
- Take plenty of fresh air and exercise.
- Visit your dentist regularly for a check up.

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14c

What's New in FURNISHINGS

New Materials and Processes

By NORMA K. METSON, *Rural Sociologist, Wellington.*

THE British Council of Industrial Design last year arranged an exhibition called "Britain Can Make It." It was planned to show the wide range of products manufactured by British firms, and the emphasis was on good design for all articles. Industrial designers are of great importance because their work is the creation of products which are efficient to use, economical to manufacture, good to look at, and pleasing to the public. In an age of mass production when thousands or even millions of articles may be made to one pattern, it is essential that the pattern be good.

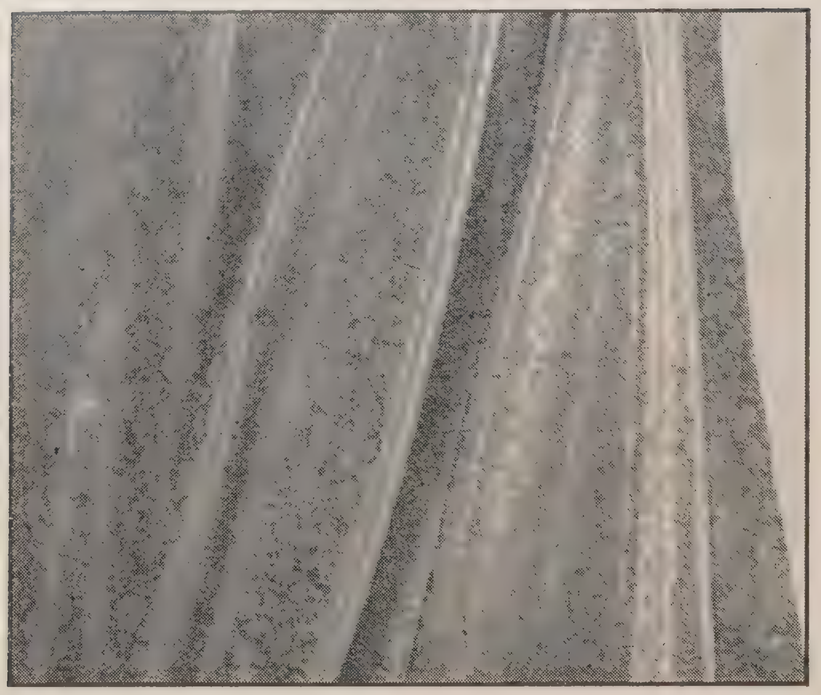
CONSTANT research is necessary—studying new materials to see if they are suitable for certain articles or adaptable to the methods of an industry; studying new processes and using them to produce original designs from old materials (for example, the manufacture of furniture from plastic bonded plywood); finding new uses for old materials (for example, using wool for very light sheer fabrics). Design nowadays means much more than deciding where to put the bunch of flowers on a teacup.

From reports and photographs of the exhibition it appears that there was an absence of very new and startling ideas, but an abundance of small improvements on older models—drawer pulls and door handles on kitchen cabinets set in so that they will not catch on clothing; small-scale washing machines and similar equipment for use where space is limited; surfaces that are easier to clean; unit furniture which can be combined in many different ways. Some new features such as an effective mildew proofing for cotton fabrics are a direct result of wartime research; others such as the use of resins to control shrinkage in woollens and rayons are just being brought to perfection and the possibility of commercial production after years of experiment.

Textile Developments

Textiles offer some of the most interesting developments. The natural fibres, cotton in particular, have become more versatile, and there is a range of new synthetics. Cotton yarns are the base for new plastic and chemical finishes. Cotton fabrics can be made crease-resistant and mildew proof, or given a permanent starching, so that ginghams, voiles, and similar materials retain their original crispness through many washings. It is doubtful if linen will ever be used again as widely as it once was because of its high cost of production in comparison with other fibres.

The following synthetics have great possibilities in the furnishing field:—Fabrics created from glass fibres, fire resistant, water resistant, fadeproof and "practically indestructible," have a flexibility and lustre which make them particularly suitable for draperies. Toughness, elasticity,



Plastic fabric suitable for such purposes as window and shower curtains, aprons, and kitchen tablecloths.

nd strength, desirable qualities for pholstery and curtains, are found in aterials similar to nylon but coarser. hese can be treated to retain a ressed shape or crease, so that really ermanent pleats round the bottoms of ose covers or bedspreads will be pos- ble.

Plastic products may be used to coat ther fibres, giving them new proper- es; they may become proof against re, water, and vermin, resistant to cids, oil, and perspiration, soft or stiff, ansparent or opaque. There is a mit to the number of these qualities hich may be incorporated in any one bric, but it is possible now to have ings more suitable for their particu- r uses than ever before. Plastics ay also be pressed out into films thin nough for light curtains or heavy nough for upholstery.

ew Floor Coverings

For floor coverings there is just re- pearing on the American market a rm of vinyl plastic which can be laid tiles or sheets. It is completely re- stant to grease and alcohol and ghly resistant to acids and alkalis, would be particularly suitable for tchen use. It is not yet available New Zealand.

Asphalt floor tiles are a new product which should soon be available in New Zealand. These tiles have the great advantage that they are not affected by dampness or alkalis and can be laid directly on to concrete floors which are in direct contact with the earth or below ground level, as in basements. Colours are right through the tiles, so cannot wear off, and as the 9in. squares are laid separately colours can be combined to make varied patterns. A relatively low-cost product, which can be kept in order by washing and polishing like linoleum, asphalt tiling is suitable for the working areas of the home and for outbuildings.

In the higher-cost class, rubber flooring can be laid in tiles or sheets. It has an attractive appearance, is comfortable to walk on, and is adaptable to the utilitarian requirements of the bathroom (moisture does not damage it and spilled liquids wipe up easily without staining) or the high standard demanded for an impressive entrance hall. There is a wide range of colours.

Cork tiles or flooring, on the other hand, can be obtained only in the natural brown shades, but these will fit in with most woodwork and colour schemes. Cork finished off by thorough polishing to build up a satisfactory surface is then non-slippery and very hard-wearing.

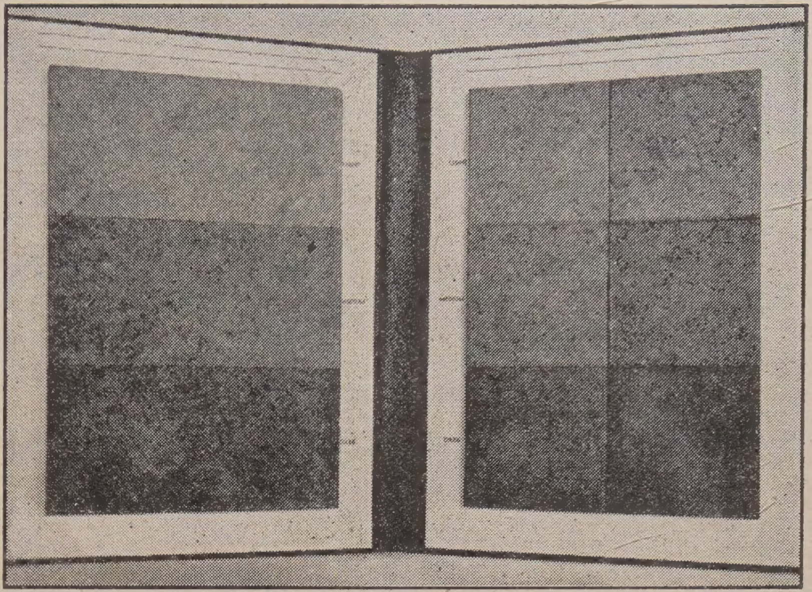
Cork and rubber are both good to use where quietness is important, and have valuable insulating properties.

Asphalt floor tiles in plain and mottled colours.

All these materials are possible substitutes for finished wood flooring and the familiar linoleum. Any new trends in carpets and linoleums are in the fashion features of colour and pattern rather than in construction or materials. The method of laying linoleum by cementing it to the underlay, which is first cemented to the floor, gives a smooth surface and eliminates buckling and cracking; dust-collecting cracks and corners can be avoided by the use of a coving.

A light-weight material with a linoleum type surface has been developed for use where washable walls are desired. It is satisfactory in bathrooms and kitchens provided there is thorough sealing round the edges to prevent any moisture penetrating behind it and damaging the fixing cement.

Lower-cost fabric floor coverings include a "pileless carpeting" of jute, a wartime product which provides a flooring intermediate between true carpeting and coir matting. New Zealand flax matting has many advantages, as its close weave gives a smooth, dirt-resisting surface and prevents dust from penetrating and collecting under the mat. It can be obtained as mats or strips in a variety of colours.



Cork flooring and tiles in varying shades of the natural brown.

Furniture Design

Though metal, glass, and plastics have their uses, wood still remains the favourite structural material for furniture. However, natural wood construction is being replaced in many cases by coreboards and plywoods, which overcome the dangers of warping and cracking in the large flat surfaces which are today preferred to panel construction for many types of furniture, for instance, wardrobe doors. True modern designs for wood take advantage of these new properties as well as improving on the traditional methods of use.

"Pileless carpeting"—jute floor covering. Approximately half actual size.

Prefabrication in furniture, as in housing, is one way of overcoming shortages of skilled labour. The parts of the article ready for assembling are made in the factory, and sent out so that they can be joined together at home by the buyer. The wood may be plain, painted, or polished. This scheme has proved popular in New Zealand for various simple pieces and is used overseas for chairs, tables, and cupboards of polished wood.

Unit furniture demonstrates the same idea on a larger scale. Standard pieces of furniture are designed of such a size and shape that they can be fitted together to make a number of useful combinations. For instance, two small lowboys with 4 drawers and a set of shelves could be used as three separate articles; the drawers placed together with the shelves above would serve as a buffet for a dining room; or lined against a wall with the shelves between they would make a useful living-room storage unit. That type of furniture cannot go out of fashion, additional units to match can be added as required, and it is very suitable in a house where there is a considerable amount of built-in furniture.

Upholstered furniture can be treated similarly: Comfortable chairs with detachable arms can be used singly with or without arms, or combined for a couch. If an overnight guest has to sleep on the couch, he will no longer

NEW FURNISHINGS . . .

have to drape head and legs over its arms. An additional seat can be slipped in, and there is plenty of length for stretching in comfort.

Lessons from Wartime

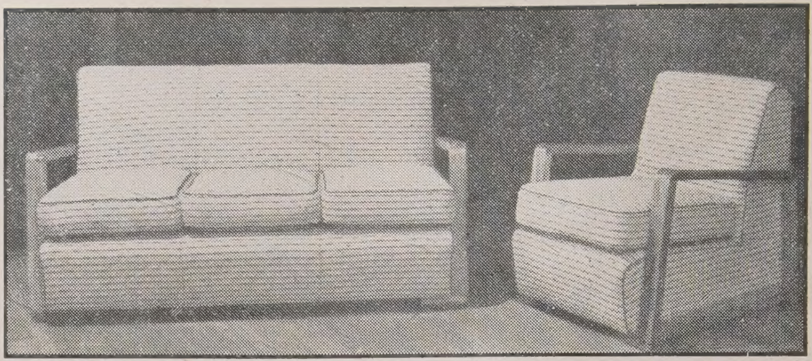
Wartime experience in the use of light metals for aircraft production has resulted in methods by which frames of astonishing strength and lightness can be built. Aircraft seats may look a little odd, but they are very comfortable to sit in, and other furniture can be built on the same principles, with metal framing replacing wood.

Aluminium with a sprayed-on, pastel-coloured, plastic finish is being used very successfully for kitchen cabinets and benches. Light, easily-handled drawers and sliding shelves, and permanent, non-absorbent, and stainproof surfaces are some of the advantages of this type of equipment. Cupboard doors which will pull up and down like blinds are featured in some new kitchens, and an item which is still really in the experimental stage is a circular cupboard in which all shelves swing round so that there is no difficulty in reaching everything they hold.

Glass and its rivals the transparent plastics have extensive uses. Glass bricks in particular are an answer to many problems. Built into a wall they are strong and durable, and though it is impossible to see through them, they let in light to previously-gloomy passages, stairs, and partitioned rooms.

If these things are desired, but are not immediately available, keep on asking about them. New ideas need to be tested out in use. All are not necessarily superior to the old, but many of them offer practical assistance to the busy and thrifty housewife.

[*Photographs by Photo News Ltd.*



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Autumn Afternoon, Central Otago

AUTUMN—I love it! The fierce heat of summer is past and I bask in the afternoon sunshine and let its rays warm me gently. In the shadow of the house there is a chill in the air which hints of frosts to come. Gone are the strident and distracting sounds of summer—monotonous chirping of crickets, unceasing birdsong, persistent hum of bees, and babbling of water over the stones. Instead, there is an all-pervading atmosphere of peace.

Autumn is silent. I don't feel it as the silence of approaching death—on the contrary, everything is teeming with life. Fat yellow marrows swell almost visibly day by day. Apples ripened to succulence snap from their twigs and drop soundlessly on to cushions of warm, dry grass. High up in the willows a warbler pipes a thin, reedy note which falls into this well of silence. Leaves flutter uneasily through the air. The Virginian creeper which yesterday glowed palely luminous through its mantle of greenery on the wall today flings scarlet banners across my vision. White butterflies flit erratically above the Michaelmas daisies and the black Persian kitten leaps at each butterfly with the grace of a ballerina. A long line of stately poplars marches up the hill opposite me, each tree aflame as though a giant paintbrush had been dipped in gold and swept upwards through the branches.

I feel drowsy—indolent. Another apple falls in the orchard. Shall I, or shall I not, pick them today?

—"Sara E.," Central Otago.

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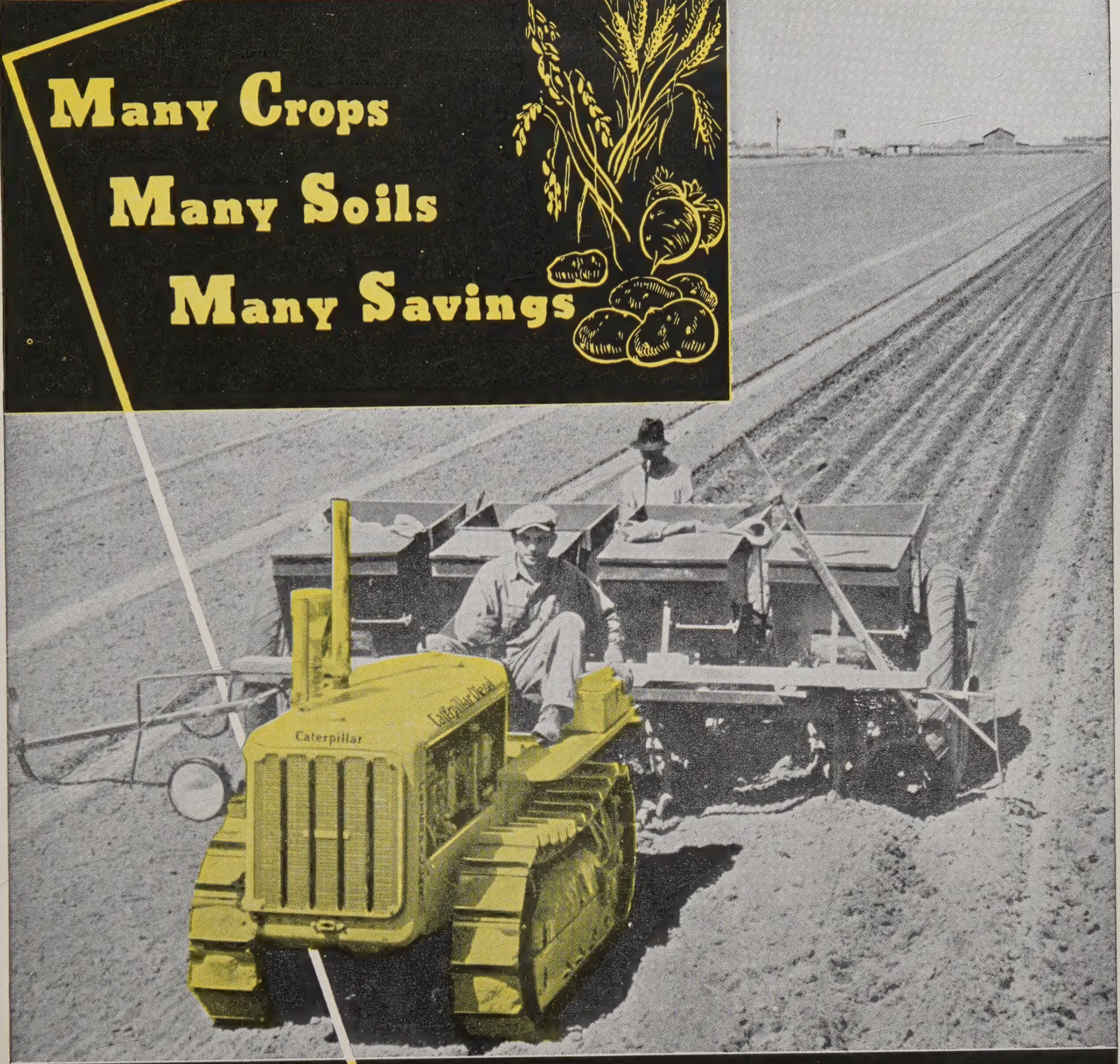

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